slib

Proceeding

CALCUTTA UNIVERSITY
CENTRAL LIBRARY

CU/L-H04736-21-0294047

46th ASLIB ANNUAL CONFERENCE

Sheffield, September 1972

The use of external current awareness services at Southampton University *C. C. Parker*

Experiences of BP's Patents Information Branch in using commercial patent documentation services *B. F. M. Helliwell*

The use of external services in a small research information department *M. A. Simkins*

21

NUARY 1973
L. 25, NO. 1

AT LAST:

A social sciences reference tool that's easy to use, highly current, and multidisciplinary too!

Beginning in 1973 it will be a lot easier to search the social sciences journal literature if your library has the new *Social Sciences Citation Index*™ (*SSCI*™).

SSCI will offer an integrated search system designed to overcome the ambiguous terminology and wide scatter of related articles that used to make social science searches so difficult. It will take advantage of two powerful retrieval methods: Citation Indexing—which utilizes the fact that an article's reference citations to earlier publications are excellent indicators of the subject of the article, and Permuterm® Indexing—a natural language system that pairs every significant word in an article's title with every other word in that title to produce extremely specific, two-level indexing entries.

With *SSCI*, all you'll need to start a search on any subject is the name of a key author in the field of interest or any English word that is descriptive of the subject. There's no need to master specialized search vocabularies or complex classification schemes.

With *SSCI* you won't have to use a half-dozen discipline-oriented indexes to assure comprehensive searches. A single look-up lets you search the entire output of over 1,000 journals from all the fields relevant to the social sciences including anthropology, community health, demography, economics, educational research, ethnic group studies, geography, history, law, linguistics, management, marketing, political science, psychiatry, psychology, sociology, statistics, and urban planning and development.

And because *SSCI* will be computer-produced, it will be the most current index of its size. That means you'll find new articles while they're still new.

Send the coupon for more information.

SOCIAL SCIENCES CITATION INDEX™
isi
SOCIAL SCIENCES CITATION INDEX™
isi
SOCIAL SCIENCES CITATION INDEX™
isi
SOCIAL SCIENCES CITATION INDEX™
isi

13-335

Please send me more information on your new

SOCIAL SCIENCES CITATION INDEX™.

NAME____________________________

POSITION____________________________

LIBRARY____________________________

ADDRESS____________________________

CITY____________STATE__________ZIP________

isi® **Institute for Scientific Information**
325 Chestnut Street, Philadelphia, Pa. 19106, USA
Tel: (215) 923-3300 Cable: SCINFO, Telex: 84-5305

©1972 ISI

294047.

Aslib Proceedings

VOLUME 25 **JANUARY 1973** **NUMBER 1**

010.5
As52 Proc.
Vol-25
Jan-Dec
1973

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer-back, Aslib London.

Editorial

1st January, 1973

Rarely if ever, for all their long history, can the British people have entered such a momentous New Year as on this first day of January, nineteen hundred and seventy-three. For the first time they have, as a deliberate act of policy, given up some small part of their sovereignty, very probably the precursor of more in due time, to join with others in the pursuit of prosperity and peace. Whether one favours British membership of the European Community or not, this is, by any standard, a traumatic step by a nation which, within a generation and for the most part with few regrets, has seen its role change from that of head of the greatest empire the world has ever known to that of a newly-admitted member of a loosely connected group of states pledged to work together to mend the rancourous divisions of the past.

This formal accession to the European Economic Community is a step taken in a spirit of co-operation and hope. The world has seen too little of either for many a long year; nevertheless they are among the strongest motivations for ordinary people everywhere. Especially must this be true of people so accustomed as we are to collaboration among ourselves in making the world's knowledge available to those who can interpret it, evaluate it and put it to good use. They will certainly characterize the great majority of those who work in British libraries and information services towards their continental colleagues as they prepare to play their part in a wider European setting. Accordingly the Council of Aslib has sent the following message to organizations concerned with documentation in the other countries of the EEC, so as to reach them on New Year's Day:

> Aslib has for long had many members, friends, colleagues and sister organizations in continental European countries. It pleasurably anticipates deepening and widening such

relationships now that the United Kingdom has joined the European Economic Community. All are united in a common understanding of the growing importance of information in modern society. It is hoped that our closer relationships will lead to greater co-operation and co-ordination of effort in research in information science, in the improvement of information flow and in the fuller exploitation of information.

On this historic day, Aslib declares its intention to do all in its power to bring that hope into reality. It is not possible to write to all whom we would wish to address in this way, but we trust that those who receive this message will be sufficiently representative to ensure widespread understanding of Aslib's intention.

What this may mean in practice must be left to the future to reveal. Too much must not be expected too soon. Initially, it may be best to aim at the extension of our relationships with others in the countries of the Community, perhaps through holding more jointly sponsored conferences, meetings and study visits; such closer relationships may themselves reveal additional ways in which we may all collaborate more effectively for the benefit of all. But however those purposes may be worked out, we look forward to a continuing exchange of views and purposeful collaboration.

May not this New Year also mark a re-affirmation of hope and of confidence in our professional future here at home? Libraries and information services in a number of fields, but especially in industry, have taken some hard knocks during the years of economic duress. Taking the long view, however, I find it difficult to believe that the outlook is anything other than promising, provided—and this is perhaps the crux of the matter—provided that librarians and information specialists as a group recognize and accept the many challenges that a rapidly changing world presents.

I made this point in a paper which has excited a good deal of enthusiasm and which I gave last spring to a Library Association conference on the survival of the industrial librarian. My reasons for optimism were, first, that the United Kingdom, after a quarter of a century without a firm sense of direction, was once again set on an economically expansionist course in an entirely new, i.e. European, context; second, that industrial expansion was the only factor capable of sustaining this role, and that the systematic acquisition, assessment and use of information would be vital to industrial policies in the three cardinal areas where industry could not afford to fall down, namely production, labour relations and marketing; and third, that information technology and systems were reaching the point of sophistication at which the information function could be made pervasive to all areas of industrial activity. Perhaps for the first time, therefore, on other than a purely local scale, all tides are running in favour of coherent company policies and cohesive company systems with regard to information flow. It follows that he who has the professional understanding and managerial skill to integrate all types of information flow into an effective management tool, and to relate it creatively to the objectives of company policy, can be in a position of immense authority and responsibility.

All industrial activity involves the flow of three main commodities: materials, energy and information. Within the information sector we can again identify three principal types of information flow: line communications, operational feedback and innovative information. The flow within industry of information of all these kinds is incessant and complex, and its handling is as vital a part of management as is the control of men, material, machines and money. Yet, for the most part only one—innovative information—has been the traditional concern of professional librarians and information officers. Nevertheless, it is operational feedback, or management information, that is at the heart of the need to monitor progress, modify performance targets and control operations. And it is line communication that conveys information up and down the lines of command and determines the efficacy of management interaction with work force. Can it honestly be said that there is any fundamental difference of principle in the collection, organization and transfer of information as between those three different sets of circumstances? Or that, if we are right in claiming the existence of an information profession, we can regard any of them as beyond our concern?

Taking the broad view is no guarantee of instant success; it requires action and determination to match. The head of one company has said that he was never able to succeed so long as he regarded himself as in the airline business; when he recognized that his sphere was transportation, nothing could hold him back. That is a challenging thought with which to wish you all a happy and successful New Year, the first as contributors, we must hope, to a happy and successful New Europe.

LESLIE WILSON

The use of external current awareness services at Southampton University

C. C. Parker

Information Officer (Transportation)
University of Southampton

Paper presented at the 46th Aslib Annual Conference, University of Sheffield, 24th–27th September 1972

Background

First of all let me say a word about the background to this case study. When I arrived at Southampton over three years ago, there were about forty-seven current awareness profiles in operation (Table 1).

	1969	*1970*	*1971*	*1972*
ESRO/ELDO	26*	11*	7	1 @ £13
INSPEC	13*	2	1	1 @ £65
CT/UKCIS	8*	8*	0	1 @ £120
ASCA IV	0	0	2	1 @ £62
SDC	0	0	0	1 @ £20
COMPENDEX	0	0	0	4*
TOTALS	47	21	10	9

(* = free)

TABLE 1: *The decline in services*

These were all free. Then, when the suppliers began to charge for their services there was a dramatic decrease in the number of users. At the time we all thought that it was simply a matter of not being able to afford the price.

Our reaction was to do all we could to make more money available both at departmental and faculty levels and at a national level with the Science Research Council and the Department of Education and Science. Presumably, as a result of reactions such as this, the University Grants Committee apparently recognized the need for funding information services, because they asked universities to include provision for these services in their quinquennial estimates. However, we suspect that if funds remain low, the services may well be squeezed out as a low priority item in university budgeting.

When the ESRO/ELDO users began cancelling their profiles, we sent them brief questionnaires asking if cancellation was simply because they could not afford the £13 charge, and also if there were any other reasons. There were ten replies and I attempted to analyse the answers by a points system (Table 2). The answers could be fitted into three categories and showed finance was not the principle reason for cancellation, although the charges had obviously made people face the decision. These results were similar to those obtained from the present questionnaire (see Appendix) where again question number 3 was an open question asking their main reasons for discontinuing the service, and the answers were again divided into three categories. For INSPEC and *Chemical Titles* users, finance was easily the most important consideration, but then these services were between three and ten times more expensive.

	Previous survey (no. of points)	*Present survey (no. of comments)*
Criticism of service	27	11
Lack of Finance	23	9
Change of Interest	22	6

TABLE 2: *ESRO/ELDO Returns*

The Questionnaire

This present questionnaire was originally sent out to people who had the service and then discontinued it. Most of these people had free experimental services originally, and had then discontinued them when charges were introduced. In some of the slides we have broken down the answers into the three main services ESRO/ELDO, INSPEC, and *CT* (*Chemical Titles*). We also obtained some answers from current subscribers, to find out what people who are prepared to pay money think, and also from a few non-users for a comparison. The questionnaire consisted of sixty-six questions, most of which had a range of answers provided, which people could tick. The returns from the questionnaires were quite good with replies coming in from Europe, India, Japan and America (Table 3). We actually had 100 per cent returns from people still at the University. I think the reason for this was that personal contact was made by telephone or individual letter in every case.

	ESRO/ELDO	*INSPEC*	*CT*
Replies	26	9	10
No. sent out	33	12	10

TABLE 3: *Numbers of ex-user returns*

Also, the first page of the questionnaire was used to explain the objectives of the exercise, including a mention of this conference. Lastly, as I had got carried away by my own curiosity and tried to do too much in the questionnaire, I used a reducing Xerox copier to make it look smaller. The whole document was condensed onto one piece of A4 paper.

The approach used in the questionnaire was to consider all the variables that might have influenced people's decisions to discontinue their service. These five variables were given as part of the explanation on the first page of the questionnaire. These were:

(i) Yourself and your work
(ii) The product
    (a) Cost
    (b) Convenience
    (c) Efficiency
    (d) Alternatives
(iii) Supplier of the service
(iv) Your organization
(v) Outside factors (e.g. 'invisible colleges')

There is no time now to go methodically through these variables looking at all the answers, so I am going to consider the three decisions which I think are important ones, and then try to use some of the results from the questionnaire to see how opinions might affect these three decisions (Fig. 1).

(awareness of service + need for service)
↓
(1) Do I want this service? Yes or No
(cost + availability of money)
↓
(2) Shall I purchase this service? Yes or No
(+ experience of service)
↓
(3) Shall I renew this service? Yes or No

FIG. 1: *The critical decisions*

The need for a service

First of all, a researcher must be aware of two things, the existence of current awareness services and a personal desire for such a service. We will assume that the researcher is aware that services exist. Our experience is that a personal approach is more effective than printed matter in publicizing these services. So we will look at his potential need or desire for a service. In question 20 most people said that when they had started the service, they thought they had a fair need, rather than a great or slight need.

Question 1 asked how important it was to be up-to-date. The majority of ex-users classed this as important rather than vital. There was not any significant difference between them and current users and non-users.

In question 13 we asked researchers how likely they thought it was that they were duplicating someone else's work. There was no positive indication here that ex-users or current users were affected by these thoughts, but the non-users understand the Southampton experience is not unique; also, money is available in universities, but it is only the high priority items that can successfully compete for it.

I can only see this as a question of apparent or anticipated impact, and exposed cost (Fig. 2). By impact, I mean beneficial effect on the researcher or on his work, and by exposed cost, I mean a cash payment as opposed to hidden costs in labour and overheads or a library allocation for that matter. In the university environment that we investigated, and in the eyes of the researchers, the information obtained through current awareness services apparently made a relatively small contribution to the success of their work—for each pound which they had to actually spend—than perhaps did equipment, computer time, materials, or even the information they obtained in the old fashioned way. Impact is probably very much a question of the attitude of the researcher, and exposed cost a function of his organization's attitude.

Furthermore, as far as I know, industry appears to be more interested in current awareness services than universities, and I think this is probably because of their commercial attitude. This leads to competition, industrial security, exposure and evaluation of hidden costs which often results in the acceptance of more exposed costs, and lastly in common and better defined objectives, which may result in more competition in fewer subject areas. In universities, with their academic attitude much of the work proceeds in a multitude of directions, so that there is less chance of duplication. Also in universities, hidden costs tend to be accepted. Communication is less of a problem in universities, where there are usually large libraries, 'invisible colleges' and frequent meetings.

All this means is that, in several fields, there is a larger information flow from universities to industry rather than the other way round. Current awareness services help by acting as a sort of pipeline (Fig. 3).

I believe in the future of mechanized information retrieval services, but I am concerned about the situation with the present systems in a university environment, because of the response I have received from users. I see informa-

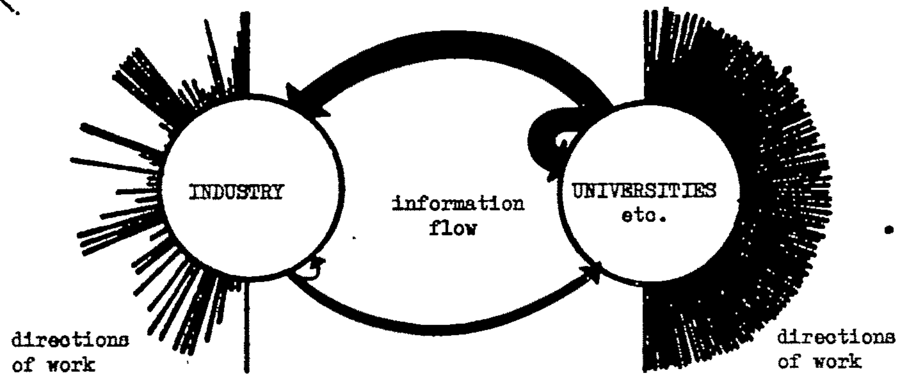


FIG. 3: *Universities/industry information flow*

tion in the widest possible sense as a basic working material, and the service as one of the working tools. But it is what the researcher does with them that really matters. Should we, perhaps, spend more time looking at the researcher and how he finds and uses that information which leads him to successful results. It certainly seems that, in practice, the relationship between researcher and information *is not* what we as information scientists think it ought to be in theory. Attitudes certainly have a great deal to do with it and I believe that there may even be a connection between the problems being found in formal education and the problems that we are finding with formal information dissemination and retrieval systems.

APPENDIX

CA services questionnaire—Southampton University 1972

		ANSWERS					
		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
I YOURSELF AND YOUR WORK							
1. How important was it, in your field, to be up-to date? (via current articles etc.*)	vital	8	5	2	15	3	3
	important	14	4	8	26	4	5
	helpful	4	0	0	4		
	not important	0	0	0	0		
	don't know	0	0	0	0		
2. What were your main reasons for wishing to keep yourself up-to-date?	purely research	9	5	5	19	3	
	mainly research	15	2	3	20	4	5
	purely teaching	0	0	0	0		
	mainly teaching	0	0	0	0		
	both equally	2	2	2	6		3
3. Please give your main reasons why you did not continue with the service?	financial	9	7	6	22		
	change of int.	6	2	0	8		
	criticism of service	11	0	1	12		
open question . . .							
4. Which Department were you in at the time?	. . . .						
5. What was your position in the Department?	. . . .						
6. Are you currently engaged in research?	YES	25	9	10	44	7	9
	NO	1	0	0	1	0	0
7. Are you currently engaged in teaching?	YES	17	5	10	32	7	9
	NO	9	4	0	13	0	0
8. How many complete current articles etc. do you read in depth each week on average?	0	1	3	0	4	0	0
	1 to 2	16	3	6	25	5	5
	3 to 5	8	1	2	11	1	4
	6 to 10	1	1	2	4	1	0
	11 plus	0	1	0	1	0	0

* articles etc. include reports, papers, patents.

		ANSWERS					
		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
9. What is the maximum number of articles that you could usefully cope with in this way?	0 to 2	9	4	1	14	3	2
	3 to 10	15	4	7	26	3	7
	11 to 20	1	0	2	3	1	0
	21 plus	0	1	0	1	0	0
	don't know	1	0	0	1	0	0
10. How many current articles etc. do you partly read or skim through each week on average?	0	0	0	0	0	0	0
	1 to 2	2	1	0	3	0	2
	3 to 5	14	4	3	21	3	4
	6 to 10	5	1	4	10	1	1
	11 plus	5	3	3	11	3	2
11. What is the maximum number of articles etc. that you could usefully cope with in this way?	0 to 2	0	0	0	0	0	0
	3 to 10	14	5	2	21	3	6
	11 to 20	8	3	6	17	2	2
	21 plus	3	1	2	6	2	1
	don't know	1	0	0	1	0	0
12. How many articles etc. did you produce last year?	0	2	1	1	4	0	2
	1 to 2	11	2	1	14	3	3
	3 to 5	11	6	7	24	3	3
	6 to 10	2	0	1	3	1	1
	11 plus	0	0	0	0	0	0
13. How likely do you think it is that you are duplicating someone else's work?	v. likely	1	0	0	1	0	1
	likely	6	3	2	11	0	1
	unlikely	14	3	7	24	5	2
	v. unlikely	2	2	1	5	2	5
	don't know	3	0	0	3	0	0
14. What would be your reaction if you found that you were duplicating someone else's work?	v. displeased	2	2	2	6	1	2
	displeased	11	4	7	22	4	3
	indifferent	8	2	0	10	1	2
	pleased	3	0	1	4	1	1
	v. pleased	0	0	0	0	0	1
15. If it was known that you were duplicating someone else's work, what would be the effect on your job?	great	2	1	1	4	1	1
	fair	5	3	4	12	3	0
	slight	11	3	2	16	0	5
	none	7	1	2	10	2	3
16. How difficult was it, for you to keep up-to-date before you had the service?	v. difficult	1	1	0	2	1	2
	difficult	10	4	4	18	4	2
	moderate	12	4	6	22	2	4
	easy	2	0	0	2	0	0
	v. easy	0	0	0	0	0	1
17. How did you keep up-to-date before you had the service?							
current journals/newspapers		20	9	9	38	6	9
recent books		5	4	5	14	2	6
conference/meetings etc.		16	5	9	30	5	7
invisible colleges		10	4	5	19	3	4
abstracting/indexing journals		11	7	7	25	4	4
current awareness publications		3	0	3	6	1	2
other information services		0	1	0	1	0	0
other methods (please specify)		0	0	0	0	0	0

		ANSWERS					
		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
....							
no method used		0	0	0	0	0	0
18. How have you kept up-to-date since discontinuing the service?							
current journals/newspapers		19	8	10	37		
recent books		5	4	6	15		
conference/meetings etc.		15	6	10	31		
invisible colleges		12	6	5	23		
abstracting/indexing journals		10	7	7	24		
current awareness publications		6	0	3	9		
other information services		5	1	1	7		
other methods (please specify)		0	0	0	0		
....							
no method used		0	0	0	0		
19. Do you read more current articles etc. since taking the service?	more	5	1	5	11		
	same	20	7	5	32		
	less	0	1	0	1		
20. When you agreed to take the service, how great did you think was your need for such a service?	great	4	4	1	9		
	fair	20	4	7	31		
	slight	1	1	2	4		
	none	0	0	0	0		
21. When you agreed to take the service, how much were you motivated by a desire to assist in the evaluation of such a service?	v. much	1	0	0	1		
	fair amount	5	6	5	16		
	a little	6	2	5	13		
	zero	13	1	0	14		
22. Have you used any similar service since stopping the experimental service?	YES	9	1	4	14		
	NO	16	8	6	30		
23. How likely do you think it is that you will use a similar service in the future?	v. likely	6	1	1	8		
	likely	11	2	5	18		
	unlikely	5	3	4	12		
	v. unlikely	0	0	0	0		
	don't know	1	2	0	3		
24. If the service was much improved so that it gave you all the references that you would want it to, at a price you could afford, how vital to your work would such a service be?	vital	4	3	2	9		
	important	9	5	6	20		
	helpful	12	1	2	15		
	little effect	0	0	0	0		
	dont know	0	0	0	0		
25 When you see an interesting reference to a foreign language article etc. (which you would normally get if it was in English), how often do you follow it up?	usually	1	0	1	2	0	0
	frequently	3	4	3	10	6	1
	occasionally	11	1	5	17	0	3
	seldom	10	4	1	15	1	4
26. When you see an interesting reference to something on microform (which you would normally get if it was in printed form), how often do you obtain the microform *and* read it?	usually	2	0	1	3	0	0
	frequently	1	0	0	1	1	0
	occasionally	12	4	4	20	3	0
	seldom	10	5	4	19	3	9

		ANSWERS					
		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
II. THE PRODUCT							
(a) Cost							
27. What are the chances that you would have continued the service if it had remained free of charge assuming no change in your circumstances?	v. likely	11	8	8	27		
	likely	5	1	0	6		
	unlikely	3	0	1	4		
	v. unlikely	3	0	0	3		
	don't know	2	0	1	3		
28. How much do you think the service that you received was worth, in terms of the current value of the pound?	£0–£10	11	3	4	18		
	£10–£50	10	3	6	19		
	£50–£100	1	1	0	2		
	£100+	0	1	0	1		
29. How easily do you think you could have raised the money to pay for a continuation of the service if you had really thought it worthwhile?	v. easily	7	0	0	7		
	easily	7	2	1	10		
	difficult	8	3	9	20		
	impossible	2	4	0	6		
(b) Convenience							
30. How easy was it to get the service started? (e.g. profile construction, time delays)	v. easy	2	1	2	5		
	easy	9	2	6	17		
	moderate	13	3	2	18		
	difficult	2	2	0	4		
	v. difficult	0	1	0	1		
31. How convenient was it to have a printout or cards every week/fortnight/month	v. convenient	9	5	4	18		
	convenient	15	3	6	24		
	indifferent	2	1	0	3		
	inconvenient	0	0	0	0		
	v. inconvenient	0	0	0	0		
32. How frequently do you think a service of this kind should provide a printout or cards	weekly	2	6	1	9		
	fortnightly	5	3	7	15		
	monthly	14	0	1	15		
	3 monthly	6	0	0	6		
	6 monthly	0	0	0	0		
33. How did you rate the printout or cards for clarity and ease of reading? (were you put off by their appearance)	excellent	3	2	0	5		
	good	7	3	8	18		
	medium	15	4	2	21		
	bad	4	0	0	4		
	useless	0	0	0	0		
34. How did you rate the printout or cards for speed of scanning? (were you put off by the time it took you)	excellent	1	1	0	2		
	good	13	3	7	23		
	medium	9	4	3	16		
	bad	5	1	0	6		
	useless	0	0	0	0		
35. What contribution do you think the services made to any successes that you have had with your work?	large	1	0	0	1		
	medium	5	3	3	11		
	slight	15	3	6	24		
	nil	5	3	1	9		
36. How easy was it for you to look at the printout or cards and decide whether or not to obtain the original articles etc.?	v. easy	1	2	1	4		
	easy	10	2	4	16		
	moderate	10	2	5	17		
	difficult	4	3	0	7		
	v. difficult	0	0	0	0		

		ANSWERS					
		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
37. How good was the service in retrieving items which referred to information which you actually used in your work?	excellent	1	2	0	3		
	good	5	4	9	18		
	medium	11	2	1	14		
	bad	6	1	0	7		
	useless	1	0	0	1		
38. How easy was it for you to obtain the majority of original articles or reports which you wanted and which were referred to on the printout or cards?	v. easy	3	2	0	5		
	easy	10	4	5	19		
	moderate	9	2	3	14		
	difficult	5	1	2	8		
	v. difficult	0	0	0	0		
39. What amount of time did you save by having the service?	great	2	1	2	5		
	fair	15	6	4	25		
	slight	9	2	3	14		
	none	2	0	1	3		
(*c*) *Efficiency*							
40. How good was the service in retrieving references which looked interesting?	excellent	0	1	0	1		
	good	9	5	8	22		
	medium	9	3	2	14		
	bad	5	0	0	5		
	useless	1	0	0	1		
41. How good was the coverage of your particular subject field by the service? (e.g. no. of journals covered)	excellent	0	2	3	5		
	good	6	4	5	15		
	medium	11	2	0	13		
	bad	6	1	2	9		
	useless	2	0	0	2		
42. How did you rate the service for supplying you with references that were sufficiently up-to-date for your purposes?	excellent	1	2	5	8		
	good	10	4	4	18		
	medium	13	3	0	16		
	bad	2	0	1	3		
	useless	0	0	0	0		
43. How did you rate the service for not missing important references?	excellent	0	1	1	2		
	good	3	4	5	12		
	medium	9	3	1	13		
	bad	8	1	3	12		
	useless	2	0	0	2		
44. How did you rate the service for not giving you too many useless references?	excellent	0	0	1	1		
	good	5	3	1	9		
	medium	12	2	5	19		
	bad	8	4	3	15		
	useless	2	0	0	2		
(*d*) *Alternative*							
45. How did you rate the service in general compared to your previous methods for keeping up-to-date?	excellent	2	2	5	9		
	good	12	6	0	18		
	same	5	0	3	8		
	bad	6	1	2	9		
	useless	1	0	0	1		

ANSWERS

		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
46. How do you rate the service in general compared to your subsequent methods for keeping up-to-date?	excellent	2	2	2	6		
	good	10	5	2	17		
	same	6	0	4	10		
	bad	6	2	2	10		
	useless	1	0	0	1		
47 Estimate the total number of references that might be produced each week (on your subject), by a service with 100% coverage?	0–1	3	0	0	3		
	2–10	12	3	4	19		
	11–30	7	5	5	17		
	31–60	3	1	0	4		
	61–100	1	0	1	2		
	100 plus	0	0	0	0		
48. In practice, how easily *would* you cope with this number of references (scanning and follow-up)?	v. easy	1	0	0	1		
	easy	4	2	2	8		
	moderate	11	1	5	17		
	difficult	6	4	2	12		
	v. difficult	4	2	0	6		
49. In your present circumstances, how would you rate the value to yourself, of a service which supplied *every single* reference in your particular subject field?	excellent	8	2	5	15		
	good	11	2	3	16		
	medium	0	3	1	4		
	bad	4	1	1	6		
	useless	3	1	0	4		
50. If you had to make a choice would you rather have access to a good current awareness service, or a good retrospective searching service (e.g. a list of references on a particular subject covering say the last 10 or 20 years)?	current awareness	17	8	7	32		
	retrospective	9	1	2	12		
51. If you had to make a choice would you rather have access to a good current awareness service or a good direct data retrieval service (physical and chemical properties, including mechanical, electrical, structural and thermal properties)?	current awareness	24	9	8	41		
	data	2	0	1	3		
52. How did you rate the service as a source of numerical data and factual information compared to other sources which you use?	excellent	0	0	1	1		
	good	3	5	1	9		
	same	10	2	6	18		
	bad	5	1	1	7		
	useless	1	0	0	1		
53. How did you rate the service as a source of experimental details, compared to other sources which you use?	excellent	0	1	1	2		
	good	4	4	3	11		
	same	13	2	5	20		
	bad	4	1	1	6		
	useless	1	0	0	1		
54. How did you rate the service as a source of theoretical considerations compared to other sources which you use?	excellent	0	1	1	2		
	good	8	3	3	14		
	same	12	3	5	20		
	bad	4	1	0	5		
	useless	0	0	0	0		

		ANSWERS					
		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
55. How did you rate the service as a source of inspiration compared to other sources which you use (e.g. browsing in current journals)?	excellent	0	0	0	0		
	good	6	1	2	9		
	same	10	5	4	19		
	bad	6	2	4	12		
	useless	1	1	0	2		
56. How did you rate the service as a general source of information compared to your network of personal contacts at work and elsewhere?	excellent	0	1	1	2		
	good	7	2	3	12		
	same	5	4	3	12		
	bad	11	1	3	15		
	useless	1	0	0	1		

III. THE SUPPLIER OF THE SERVICE

		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
57. What was your general impression of the service and facilities that went with the printouts or cards (e.g. help with profile construction, ease of amending the profile)?	excellent	0	2	3	5		
	good	14	4	7	25		
	indifferent	9	2	0	11		
	bad	0	1	0	1		
	useless	0	0	0	0		
58. Was there any follow up by the supplier to encourage you to continue the service?	YES	5	5	4	14		
	NO	21	4	5	30		

IV. YOUR ORGANIZATION

Do you think the University should do more to:

		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
59. Advertise information services?	YES	17	4	4	25		
	NO	6	4	4	14		
60. Finance information services?	YES	20	6	9	35		
	NO	4	3	1	8		
61. Advise on information services, and help with profile construction?	YES	19	7	4	30		
	NO	5	2	4	11		

V. OUTSIDE FACTORS

		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
62. How many people would you guess there are working in your field (working on similar topics)?	0 to 5	1	0	0	1	1	1
	6 to 15	2	0	1	3	1	2
	16 to 40	7	3	1	11	1	1
	41–100	6	3	4	13	1	1
	100 plus	11	3	4	18	3	4
63. How many of these workers have you been in contact with?	0	1	0	0	1	1	0
	1 to 3	1	0	0	1	0	3
	4 to 8	6	2	1	9	0	1
	9 to 15	7	3	3	13	3	1
	16 plus	11	4	6	21	3	4
64. Do you consider yourself to be a member of an 'invisible college'?	YES	15	5	6	26	5	3
	NO	11	3	4	18	2	6
65. Do you consider that direct contact with people (meetings, correspondence, telephone) is your most important source of information?	YES	13	4	1	18	2	5
	NO	13	5	9	27	5	4

		ANSWERS					
		ES	*IN*	*CT*	*TOT*	*CU*	*NU*
66. Which do you like best for information, abstracts or lists of keywords/indexing terms (in addition to the reference)? (added question)	abstracts	21	8	9	38	5	7
	keywords	2	1	0	3	2	0
	same	0	0	1	1	0	1
	don't know	1	0	0	1	0	0

KEY
ES = ESRO/ELDO ex user
IN = INSPEC ex-user
CT = *Chemical Titles* ex-user
TOT = Total of ex-users
CU = Current subscriber
NU = Non-user

Experiences of BP's Patents Information Branch in using commercial patent documentation services

B. F. M. Helliwell

Head of Patents Information Branch, British Petroleum Co. Ltd

Paper presented at the 46th Aslib Annual Conference, University of Sheffield, 24th–27th September 1972

THE IMPACT of an external documentation service on the operation of an Information Unit cannot be fully appreciated unless the position of that unit in the parent organization and its function and method of operation are understood. In British Petroleum, there is a single Patents and Trade Marks Division, responsible *inter alia* for all parent matters for the BP Group world-wide, so that the subject matter field handled is very broad, including such subjects as oil exploration and production, refinery apparatus and processes, oil products, petrochemicals, polymers, plastics, detergents, pesticides, microbiological production of proteins and instrumentation.

The Patents Information Branch is part of this Division and its main function is to make searches and write reports assessing the results of the searches in order to provide a knowledge of the state of the art to assist patent agents in drafting and progressing new Company patent applications and handling all problems of infringement, opposition and validity in relation to BP and competitors' patents. Information searches are also made to assist research projects and for marketing purposes. In addition the Branch is responsible for providing a current awareness service on newly published patent specifications for patent agents and other staff in the Group, and for providing documentation on patents for searching purposes. At present the Branch is staffed by nine searchers, all chemistry graduates, and the library of abstracts, patent journals and specifications, and text-books, which is part of the Branch, is staffed by a Librarian and four clerical assistants.

Until 1963, before any relevant external documentation service was available, the Branch had to provide all the classified patent abstracts required for current awareness and searching purposes. A selection of newly issuing patent specifications in six major countries was made weekly, the specifications were purchased, circulated for current awareness purposes, and abstracted. The abstracts (some 450–500 per week) were classified according to a simple classification system of some sixty headings, biased towards processes rather than chemical products to provide an alternative to the British and US Patent Office classification systems. The abstracting effort was eased somewhat by using outside abstractors and by exchange arrangements with other companies. The abstracts were filed according to subject matter, company, patent number and priority date (for equivalent searches) and the same abstracts were issued in booklet form as a current awareness tool for circulation within the Group (on a wider basis than circulation of the specifications). In 1962 the pressure of work on the abstracting and classifying side was so great that the backlog was several months at best, and several years for some countries. A high proportion of the staff effort was used for documentation, each graduate spending about 60 per cent of his or her time on documentation and 40 per cent on searching. Many searches were sent out, mostly to the IIB in The Hague.

In January 1964 the American Petroleum Institute started their documentation service on patents on refining processes and oil products, which included a fair coverage of patents on petrochemicals, and BP has subscribed to this service from the beginning. The service includes a journal of classified abstracts, and we obtain many copies of this journal and circulate it for current awareness purposes. The service also includes copies of the same abstracts on cards which we file under patent number, company, priority date and abstract number.

Various indexes are provided. Each abstract is classified by 25–30 descriptors; some priority of importance is assigned to the descriptors and as a result there are two manual searching tools. One is a so-called 'Alphabetical Subject Index' in which only the six or seven most important descriptors are included, with an expanded title; this is not suitable for exhaustive searching but is often used for quick location of known subject matter and for preliminary searches. *All* descriptors are included in the main manual search tool which is a 'Dual Dictionary'; this is produced from magnetic tapes which are available to subscribers for computer searching. The immediate impact of the API service was to reduce greatly the load of documentation work on the Branch. We still selected patent specifications of interest and circulated these, but we stopped abstracting anything included in the API service and stopped producing any current awareness bulletin internally, using the API journal instead. This immediately gave more time for searching and enabled the Branch to catch up backlogs of abstracting and classifying within a few months. From that time the major effort in the Branch has been in searching. The magnetic tapes were purchased but not used much except for test purposes for the first two to three years because a manual Dual Dictionary search was then still quite feasible, and because we found that a considerable initial research effort was required to master the techniques for searching successfully by computer. A major problem was to understand fully the coding philosophy used by API. However, by 1971 most searches through the API system were made by computer, but we were already beginning to find that searching a serial file by computer was lengthy and therefore expensive, even with the simplest print option, which is a listing of abstract numbers only. API has now converted the tapes to a random access format on discs and are operating a bureau service for computer searching. The results are very satisfactory and search time extremely short, averaging about four minutes for a seven year search.

In 1966 we took out a subscription to a second major documentation service, Plasdoc, produced by Derwent Publications, which covers patents in a dozen or so countries on polymers and plastics. This service provides a journal of abstracts, abstracts on cards which we file as for the API system, a separate card file of classified abstracts for manual searching and magnetic tapes for computer searching. This subscription enabled us to decrease still further the amount of abstracting and classifying work and provided us with a second journal which could be circulated for current awareness. Unlike the API service, which provided classified abstracts totally within a subject matter field which we had covered previously, the Plasdoc coverage was much greater than our previous coverage. This was valuable since our interest in polymers and plastics was increasing. Again the initial major benefit was in time saved in abstracting and classifying, but by now an additional benefit is that we are using the computer tapes regularly for searching. The manual search system is still used sometimes but it is already cumbersome and uneconomical on search time. The magnetic tapes were first run in-house, but we encountered many problems with changes in programmes and now find it better to use that bureau which carries out all the Derwent computer work.

API and Plasdoc are the two main systems we use, but, in addition, since 1966 we have received the Tulsa University Service of abstracts on oil exploration and production, which provides an abstracts journal and manual search indexes, and at present we are investigating computer searching of this Tulsa system. We also subscribe to the Derwent 'Chemdoc' system which is similar to Plasdoc but covers low molecular weight chemicals only. For Chemdoc we only subscribe to the manual indexes since we are not satisfied that the mechanized retrieval code is sufficiently relevant to our interests. However, both the Tulsa service and Chemdoc have relieved the Branch of further areas of abstracting and classifying.

How does the Branch function to-day? We still select specifications each week, now in eight countries, because we consider that we have a primary responsibility to ensure that the Patents Division has knowledge of all specifications of interest, and the external documentation services are not 100 per cent reliable on coverage. Patents in those fields of interest not covered by the external services, or for special current awareness purposes, are abstracted and classified by ex-members of staff working at home, and the documentation work still done in the unit now represents less than 10 per cent of the total effort. The number of searches completed annually has increased from seventy-three in 1962 to a steady average of two hundred, and whereas the number of searches sent out averaged forty per year until 1970, in the last two years we have sent out only about five searches per year, all on highly specialized topics outside our normal fields of interest. The standard of searching and reporting has improved, since more time can be spent on each search. The staff are now highly specialized searchers, rather than abstractors who also search, and are much happier and more interested as a result. Also, we now have some free time to go back to our old abstract system, which of course is still used extensively, and consider some reclassification.

Against the cost of the various documentation services and fees for computer searching can be set the money saved by the enormous reduction in the number of searches sent out, the reduction in the number of abstracts made by outside abstractors and purchased from other companies, and the reduced costs of typing and reproducing abstracts in-house.

It must also be remembered that the external services give a greater coverage on both subject matter and countries than we used to attempt when all documentation was internal.

To summarize the main advantages and disadvantages to BP of using these services, we have, on the plus side:

(1) Abstracts and searching means available to maximize the searching effort, whatever the staff situation. In the past, abstracting and classifying were an unavoidable work load and in times of staff illness or holidays tended to take priority to avoid build-up of backlogs and thus squeezed the searching effort available.

(2) Broader coverages on countries and subject matter.

(3) A happier staff, since most people prefer searching to abstracting and classifying and enjoy the challenge of searching by mechanized means on different systems.

On the minus side:

(1) Considerable research effort is required fully to understand the philosophy of coding and the application of the coding by the staff of the service suppliers. This is essential. Unless the coding method is fully understood search results can be disastrous. A difficulty with all external services is that the staff are totally concerned with classifying for input and have no experience in retrieval by searching the system which they provide. A problem for our searchers is that they have to learn to work with a number of different services, each having a unique coding system and each having retrieval problems peculiar to itself.

(2) We have had to accept and adapt to constant changes in the services. Such changes are designed to suit a majority of subscribers but demand flexibility by any individual unit in handling the service. We have found it well worth the time and effort to co-operate in subscriber groups to try to exercise some control over the services.

(3) Considerable effort and cost are involved in running computer searching in-house. We have come to the conclusion that, overall, bureau searching is cheaper and saves considerable time and constant headaches, providing you find the right bureau and can accept possible confidentiality risks.

In conclusion, we consider that in BP we have reached the point of reasonable balance on external documentation services. We could cut internal abstracting and classifying almost to nil if we subscribed to other systems, e.g. other parts of the Derwent Central Patents Index, but this would give us far too much irrelevant coverage in relation to the relevant content. We do, of course, keep a constant watch on new services, such as the 'new look' Uniterm system to be published this year by IFI/Plenum Data Corporation, to assess whether these could be of further use to us, or whether they might be better than, and could replace, one of the services to which we currently subscribe.

The use of external services in a small research information department

M. A. Simkins

Head of Research Information,
Smith Kline & French Laboratories Ltd, Welwyn Garden City

Paper presented at the 46th Aslib Annual Conference, University of Sheffield, 24th–27th September 1972

IT IS PART of the responsibility of an information department to decide which of the available external abstracting and indexing services it, and the scientists it serves, should use. I propose in this paper to attempt to analyse the choices which must be made and to draw attention to the questions which each user must ask. In most cases I am not able to supply satisfactory answers, but I hope that other people may do so.

My picture of the paths by which information in a scientific paper may reach the mind of its eventual user is shown in Figure 1. The underlying philosophy is that 'information' is not a list of titles, a pile of abstracts, or even a collection of photocopies of articles; it is new knowledge, new ideas, perhaps a new slant on old ideas, in the mind of the research scientist. The objective of the systems must be to make it easy for the research scientist, either by his own efforts or with the help of an information scientist, to find and absorb this information. The scientist may go straight to the journal, perhaps on the advice of a colleague or information officer, or he may be made aware of an article through a secondary service. The lower part of Figure 1 shows the alternative stages which may intervene between the journal and the reader in the latter case.

There are three main decisions to be made: (a) which data base or bases to use; (b) which selection procedure to use—computer or manual search—for selection from the data base; (c) what sort of output to demand—abstracts, title plus keyword, or title only. These are not independent choices because each data base provides only limited options for selection and output, and the decisions about these influence the choice of data base. There is also another choice to make: how should resources of time and money be divided between original journals and secondary services?

Much that I say will necessarily apply to current awareness services rather than to facilities for retrospective searching, because it is in the current awareness field that the widest choices are available, but there is another choice implicit here: what is the relative value of a service designed for current use only and a service with good retrospective search facilities?

(a) Choice of data base

Most people would regard comprehensiveness as the most important quality to look for in a data base: you cannot hope to get out of it material that has not

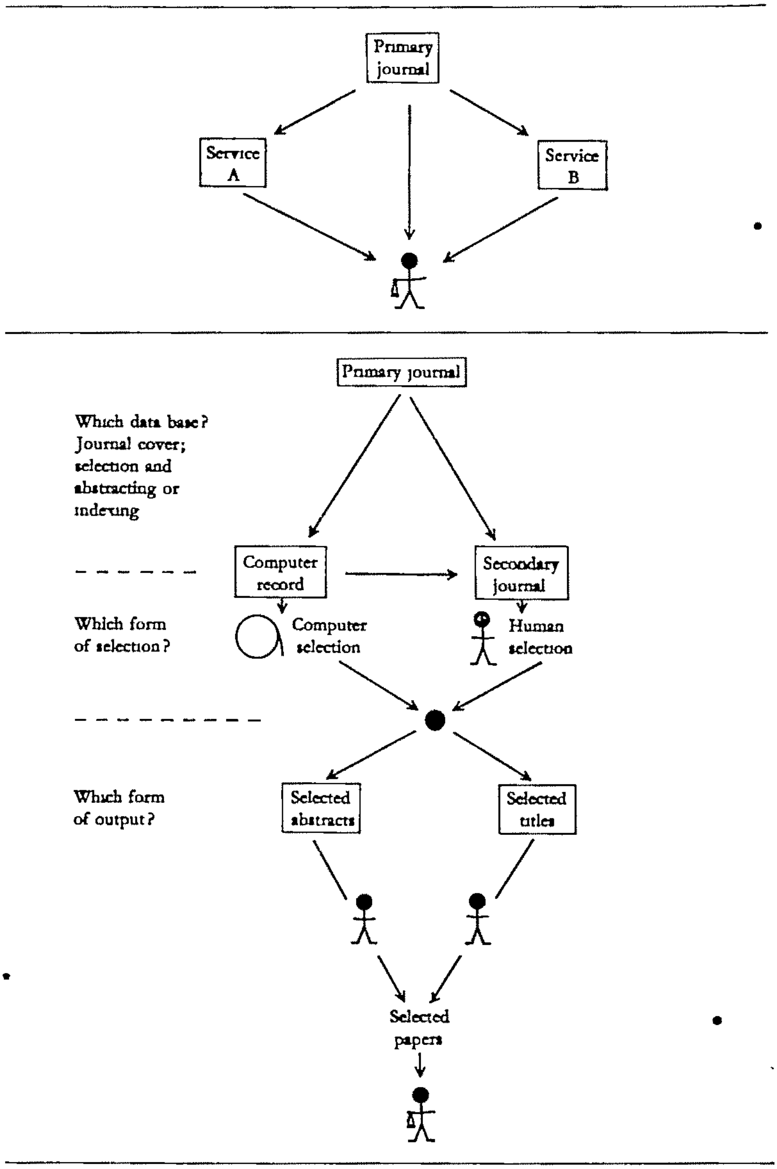


FIG. 1: *The use of external services in a small research information department.*

been put in. Certainly for retrospective searching we need access to a comprehensive data base such as *Chemical Abstracts*, but I wonder just how important comprehensiveness is for current awareness? Can you *use* (i.e. process and comprehend) *all* the current information on your subject? I think it is more vital that the data base should contain most of the *important* information than that it should contain every single item.

For current awareness it is more valuable to have appropriately selective cover—that is, the data base should cover the areas of most interest to you most thoroughly, the fringe areas less thoroughly, and the totally irrelevant areas not at all. This may be achieved with a comprehensive data base which is subdivided into suitable smaller packages: for instance, the separate sections of *Chemical Abstracts* give ideal cover for some subjects. Use of a data base with this sort of selective cover cuts down both the cost and the noise of an SDI service.

Another quality which is important in judging the usefulness of a data base is the efficiency with which it carries out whatever indexing it provides. A paper which is wrongly indexed or classified cannot be found; a keyword mis-spelt will be missed by a computer search. This point is vital for retrospective searching and for computer-based SDI; the human eye in manual scanning is somewhat more tolerant of mistakes. An indexing system which does not allow for the type of subject which interests you means that you cannot easily use it, even if the system contains the papers you want.

(b) Choice of selection method

If your chosen data base contains the paper you want, how do you get at it? The advantages of a computer for SDI searches are well known—a saving in skilled manpower, avoidance of clerical effort and mistakes, provision of a printed output—but I would like to make some points on the other side.

First, good computer SDI is not a completely automatic process, it starts with careful and intelligent work on profile construction. Research interests change continuously, so for best results there should be some skilled attention all the time. In practice it is all too easy to leave profiles running at less than the optimum efficiency and still rely on them. The human searcher, in touch with current research needs, has the advantage of continuously and subconsciously modifying his 'profile'.

Secondly, for reasonably good recall, computer SDI usually gives only moderate relevance. This is not a serious fault provided the irrelevant material can easily be identified and discarded, but it does mean that there is a further intellectual step between the computer and the ultimate user. By contrast, a human searcher should be able to produce much higher relevance or rather, much more accurate selection of *useful* material, for the same or better recall because his mental 'profile' is much more elaborate and also more critical.

Another point worth considering, if you use a secondary service to supplement scanning of current original journals, is how you avoid wasteful duplication. A computer profile can be constructed, at a cost, to exclude all the journals you scan regularly, but this does not then automatically allow for the journals that go astray in dock strikes or postal strikes or the fact that you were on holiday last month or just failed to see something you should have seen. On the other hand, the human scanner finds it relatively easy to recognize and ignore the items already processed.

Of course the computer may play its part in producing an index for manual use: this is a valuable service.

(c) Choice of output—abstracts or titles only?

The choice between a 'titles only' service, a service providing titles and keywords, and a service providing abstracts is bound up to some extent with the value you put on speed: it is reasonable that a 'titles only' service should be fastest and one with abstracts slowest. If you feel that it is vital to get the earliest possible alerting to papers in journals which you do not see, then you must accept 'titles only'. However, most people are prepared to wait a few months for current information and so have to consider what value they put on abstracts.

Suppose you have chosen a service providing computer SDI, what happens when you receive the output? It will be possible to divide the references into four categories: (1) in your library; (2) not in your library but obviously important; (3) not in your library, questionable interest; (4) not in your library, obviously not interesting. The first group are easily dealt with if you have not already seen them, the second group can be ordered for you by the library, and the fourth group present no problem. But what about the doubtful ones? If your output gives you only title, and perhaps a few keywords, this group may be substantial and embarrassing. You may decide to visit a large central library once a week or once a month and look at the originals; if you are conscientious you may order them all anyway, at considerable cost to your library; you may keep the references until you can trace an abstract in an appropriate abstracts journal, but this is troublesome and you might as well have relied on the abstracts journal completely; or you may put them on one side and forget about them. If the reference is to a journal in a difficult language, it is more likely to end up in the 'questionable use' group and in the 'put on one side' file. In this case, are you paying for a comprehensive data base and then not using it? The problem is probably more serious if the final selection is done by a research scientist rather than an information scientist, because I think he is less likely to make the extra effort to find a difficult paper.

If a service provides abstracts of any sort, it is much easier to judge the potential usefulness of a paper; if the abstracts are good you may get the information you need from the abstract without having to find the original and get it translated. (Remember, our objective is information, not references.) We have a real need to reduce to a minimum the expensive and irritating job of chasing references which add nothing to our knowledge.

In my view there is no doubt about the usefulness of abstracts for retrospective searching, and a service which provides abstracts is also preferable for current awareness provided it is not too slow.

(d) Original journals versus secondary sources

Rising journals' cost make us desperately anxious to reduce our journal subscription lists and it would be nice to think that the use of secondary services would help us to achieve this. In practice, however, we find it is the research scientists who insist that the library must hold their own particular journals. Secondary services may help each individual scientist to read fewer journals but they do not reduce the total the library needs.

Once the library takes a journal, it costs very little for the information team to scan it for papers of high relevance, and this is the obvious first line of alerting. If you wait for computer SDI to alert you to your own journals, then by the time you receive the reference the journal may be on circulation or on loan and time will be wasted locating it.

To summarize, I regard secondary services as: (a) the source of information in journals which you don't receive; (b) a line of defence to find papers which you missed before; and (c) essential tools for retrospective searching. I think the best type of secondary service is one which gives abstracts and indexes as fast as possible and has appropriate literature cover; given suitable presentation of the abstracts, I think human selection can at least equal the computer. Computer retrieval is necessary if the only available data base is very large, or if one individual has to handle searches for a large number of subjects, but to be used properly it demands further intellectual effort by the recipient. Use of a secondary service never saves staff time (it is more likely to increase indirect costs), but it makes available information which would otherwise be inaccessible.

Returning to Figure 1, the pathways involving computer selection also need human processing at the output end. On the pathway involving *manual* screening of an *abstracts* journal, the two selection processes are done in one operation and with a high level of critical selection, and this seems to me the most efficient approach.

In some circumstances it is important to find every paper with even a mention of a particular subject, but very much more often the problem is to find the most important, interesting and novel information as quickly and cheaply as possible. This can be done better from a selective data base than from a comprehensive one, better from abstracts than from titles, and in my experience faster from some form of hard copy index (possibly computer produced) than by waiting for a computer search.

BRIEF REVIEWS

DEUTSCHE BUNDESREPUBLIK. Das Informationsbankensystem. Band II. Materialband. Band III. Literatur zu den Informationswissenschaften, 1960–1971. Cologne: Carl Heymanns Verlag, 1971–1972. DM 45 and DM 54.

The first and basic volume of this Report, by an official Inter-Departmental working party of the Federal Republic, on a national information system was reviewed in the *Journal of Documentation* (28, 1972, p. 277–80). These two volumes contain supporting documents in the form of papers by individual consultants, comments by large industrial firms and summaries of international recommendations by such bodies as Unesco (the UNISIST plans); and a comprehensive annotated bibliography (5734 references).

GREAT BRITAIN. Department of Employment. Classification of occupations and directory of occupational titles. London: HMSO, 1972. 3v. £7. (SBN 11 360092 5)

CODOT is a classification, based on the work performed, of 3,500 separate occupations covering 11,000 different jobs.

Volume I contains introductory matter and an index which refers the user to the definitions of occupations in volumes 2 and 3. In the latter volumes, each occupation receives a single-sentence definition which is then expanded to specify all essential aspects of that occupation. Details are also given of additional work which may be performed by the person in question (with cross-references to related occupations) and of alternative occupational titles. Librarians, archivists, information officers (this title is preferred to that of 'information scientist'), intelligence officers, curators, trainees and other specialist occupations in the field, form a unit group within the somewhat heterogeneous minor group 06, 'Professional and related occupations supporting management and administration not elsewhere classified'. Library assistants are separately classified in 'Record keeping and library clerical occupations'.

CODOT will be used within the Department of Employment for vacancy classification and for improving manpower information. For employers, it has three main uses: (1) for describing jobs when vacancies are notified to the Department; (2) for completing occupational statistical returns; and (3) for improving manpower planning by better occupational classification and identification.

Though expected to last ten years, the classification will be updated and corrected by supplements.

1972 MICROFILM SOURCE BOOK. New York: Microfilm Publishing, 1972. 164 pp. £11.50.

This directory claims to be the most extensive compilation of information on the microfilm industry in existence and to give sources of supply for every important microfilm service and piece of equipment. It includes a month-by-month review of microfilm activities in 1971; a calendar for 1972–73; a detailed microfilm products index giving company names, model numbers and prices; custom equipment manufacturers; associations active in the field of microfilms;

a basic microfilm bibliography; a trade names directory; a selected glossary; the fluctuations of microfilm stocks and shares; micropublications; a basic Computer Output Microfilm (COM) bibliography; index to COM service bureaux; names and specifications of COM recorders; index to microfilm service bureaux; a guide to microfilm consultants; a company address list; and a guide to storage centres.

The bias throughout is toward the American microfilm industry; prices are given in dollars, the addresses are mainly of companies' US offices (only in the sections on COM and microfilm service bureaux is there a substantial list of British facilities, but even here no services outside the Anglo-Saxon world are listed), and the National Reprographic Centre for documentation and Aslib are nowhere mentioned. Though this emphasis militates against the directory's use by non-US enquirers, its coverage of the American industry must be unrivalled in its detail.

In Europe, the sole agent for this work is Microinfo Ltd, 4 High Street, Alton, Hampshire.

PRITCHARD, ALAN. A guide to computer literature: an introductory survey of the sources of information. 2nd edition, revised and expanded. London: Bingley, 1972. 194 pp. £2.75. (085157 143 3)

This revised and expanded 2nd edition of a guide first published in 1969 is necessary owing to the rate of increase in the amount of information and secondary and tertiary information sources in the field of computing. The author states that the number of periodical titles in computing seems to be doubling every 4–6 years, as compared with the doubling period of 10–15 years which is generally quoted for science and technology as a whole.

After general chapters on computer literature, following chapters deal with a particular form of primary material or secondary source. This edition includes chapters on sources of information for hardware and software, company data, installations and industrial statistics. Each chapter lists relevant publications, with a short statement on the content of each, and in the case of journals, date of commencement of publication is given. No bibliographic details of the periodical publications are given, though date and publisher are given for the books mentioned. An appendix lists the 120 serials containing 50% of the relevant articles published in 1966. Journals are ranked in order of productivity and the country of publication is indicated.

This publication should prove useful to those requiring an introduction to the literature of this subject.

WORLD GUIDE TO LIBRARY SCHOOLS AND TRAINING COURSES IN DOCUMENTATION. Paris: Unesco; London: Bingley, 1972. 245 pp. £3. (0 85157 140 9)

This directory has been compiled by Unesco mainly with the aim of assisting the provision of trained staff in the developing countries. It covers over three hundred teaching institutions in some sixty countries. It includes not only schools of librarianship and information science, but also professional associations which control library education and other institutions which offer courses of varying lengths. Information is given about the curriculum, duration of courses, degrees or diplomas awarded, conditions of admission, numbers of professional staff, and whether foreign students are accepted. Entries are either in English or in French. As one would expect in a compilation of this sort, the amount of information supplied in each entry varies in detail, and although the entries are all based on replies to a standard questionnaire, they are not always strictly compatible. The editing is anything but perfect—one Belgian Library School has two entries under alternative forms of its name. We are not told when the information was collected, but some of it at least is a couple of years out of date. The book will be of value mainly for the information it gives on countries for which other sources of information are not readily available.

Letters to the Editor

Dear Sir,

COPYRIGHT AND THE BSI

I wonder if any other information workers who have given freely their own and their employers' time and expenses to British Standards Committees, have been disturbed by the BSI claim of absolute copyright?

It appears that reprint permission is impossible to acquire and that one is expected to purchase bulk copies at discount. This is a grave restriction in those areas where we seek, not to improve a commercially manufactured product, but to standardize on our professional working methods. For example, I cannot reprint the recommendations on bibliographic citation, alphabetic filing, report writing or the presentation of theses because BSI claim absolute copyright.

While I cannot pretend to have contributed to all these committees, I certainly believe in their aims and think that it is wrong of BSI to use the Copyright Act as a commercial defence. After all, they do not pay their authors, and the ideas they publish may well be corporately owned elsewhere.

I have written along these lines to all organizations represented on BS PO/20 and would like all information workers everywhere to, at least, give the matter a little thought. Meanwhile I would ask Aslib to consider existing as a standardizing body in its own right and not to sacrifice disseminative power by allowing BSI to place its monopoly position for commercial purposes above the stated object in its Royal Charter to 'promote the general adoption of British Standards'.

Yours faithfully,
R. D. GEE, FLA
Senior Information Adviser

Kingston Polytechnic
Penrhyn Road,
Kingston-upon-Thames,
Surrey KT1 2EE.
29 November 1972.

Miss J. M. Pring, Joint Secretary of the British Standards Institution, replies:

The declared aim of BSI always has been and remains the promulgation of British Standards and the promotion of their use in UK industry and national life. There have in recent years been increased commitments in standardization not least with the considerable expansion of international work in which BSI serves to promote UK interests worldwide. BSI now has nearly 8,000 projects in hand, taking national and international together, and services 4,500 national technical committees comprising 25,000 committee members. For this work the necessary resources, both in terms of the skill and knowledge available in committee representation and financial contributions of industry and government, must be forthcoming.

The proportion of contribution as between subscribers, government and sales revenue is roughly one-third. When seen in this light, revenue from the sales of British Standards forms a vital contribution to the whole process of standards making. In principle we are pleased but it is clearly in the interests of BSI and ultimately industry that the expenses of processing and publishing a standard are adequately recouped. It is therefore our policy not to give permission for the free reproduction of entire standards where we consider our publication will meet the need.

In the particular case to which Mr Gee refers, permission was withheld in view of the fact that the entire content of the standard was involved. In addition, the standard concerned was newly published and relatively inexpensive, bulk supplies being obtainable at a generous educational discount.

An explanation of the copyright position is now included at the front of all new standards and in the BS *Yearbook*, reminding users of British Standards that copyright subsists in all BS publications and that no part of any publication may be reproduced in any form without the prior written permission of BSI. This does not of course preclude the free use of necessary details in the implementation of standards. There is usually no objection to the use of limited extracts and the chief reason for requiring requests in writing is to ensure that the material concerned is up-to-date and to enable our technical staff to advise of any revisions or amendments pending. Where extracts are extensive and their reproduction is likely to have a detrimental effect on sales, fees may be involved.

We encourage the wide dissemination of the information contained in British Standards in every way possible whilst at the same time protecting what has become a principal source of income upon which the work of the Institution depends.

Dear Sir,

SCANNING

One sees and hears, more and more often, the phrase 'manual scanning'. As the word manual comes from Latin '*manūs*' (hand) the phrase means 'scanning by hand' and the only operation this suggests to me is the scanning of texts in Braille! (Strictly, of course, this is digital, i.e. finger scanning, but that may suggest something else altogether!)

If people want to specify scanning by human beings why do they not write, or say, 'personal scanning' or 'human scanning'? However, until a machine is produced which can scan in our sense (as opposed to read) why not simply 'scanning'?

Yours sincerely,

D. J. CAMPBELL

Sundial House,
60 Woodcote Valley Road,
Purley,
Surrey CR2 3BD.
15 November 1972.

Bibliographies are the librarians' primary aids . . .

LIBRARY ASSOCIATION BIBLIOGRAPHIES INCLUDE:

Bibliography of the dog. E. C. Jones. £12 (£9.60 *to members*)
London theatres and music halls, 1850–1950. Diana Howard. £4 (£3.20 *to members*)
Bibliography of nursing literature. A. M. C. Thompson. £4 (£3.20 *to members*)
Bibliography of film librarianship. Sam Kula. £1 (£0.80 *to members*)
Serial publications in the British parliamentary papers. Frank Rodgers. £2 (£1.60 *to members*)
Steam locomotive development. Kevin Jones. £2.25 (£1.80 *to members*)

Write for our Publications List to:

**THE LIBRARY ASSOCIATION,
7 Ridgmount Street, London, W.C.1.**

FIRST for carpets
Dodson Bull

UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display
In our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 68402
BRISTOL: 2-3 Royal London House, Queen Charlotte St
BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SB.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LB.
Tel: Southend 46569
9.00-5.30 Mon.-Fri. Sat. 9.00-12.00 (Manchester 9.00-4.00)

LIBRARY BINDING

This has been our trade since the last century, and in practising our craft we have given service to all types of libraries in many corners of the World.

We like to think we still bind books for libraries rather well, apart from our other activities as publishers and booksellers.

CEDRIC CHIVERS LTD
PORTWAY
BATH BA1 3NF

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of { specific / recent } information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

3 MAY 1973

Mansell
new library science titles

How do U.K. libraries acquire publications from 'difficult' areas?

ACQUISITION & PROVISION OF FOREIGN BOOKS
by National and University Libraries in the United Kindgom

The proceedings of a symposium held by the University, College and Research Section of the Library Association, Great Britain

Edited by B. C. Bloomfield

This monograph makes available to all buyers of foreign books the specialized knowledge of major British collections. Librarians from the British Museum, the School of Oriental and African Studies, the Bodleian Library, and other important centres discuss their experiences with non-European publishing. The papers include a survey of region by area of specialization, provide useful insights into indigenous national practices, and offer practical acquisition techniques.

December 1972. *Cloth.* £3.00 (*U.S.* $7.50). ISBN 0 7201 0299 5

Which libraries have published their catalogues in book form?

PUBLISHED LIBRARY CATALOGUES

Compiled and edited by Robert Collison

The major published catalogues in the English language are grouped together by subject in this guide to library catalogues in book form. Reflecting the specialized interests of the libraries they represent, the catalogues are analysed for content and idiosyncrasies, with a key to size and publishing background.

In preparation - reserve your copy now. ISBN 0 7201 0369 x

Mansell 3 Bloomsbury Place London WC1A 2QA England

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib

Proceedin

FEBRUARY 1973
VOL. 25, NO. 2

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{array}{l}\text{specific}\\ \text{recent}\end{array}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

Aslib Proceedings

VOLUME 25 FEBRUARY 1973 NUMBER 2

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for Contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double-spaced, single-sided, on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

A future for the bulletin?: the results of an enquiry into how bulletins are used in today's special library

T. Whitehall

Group Librarian, Brooke Bond Liebig Ltd

Paper first presented at the Annual Conference of the Aslib Electronics Group, 16th–18th July, 1972, and then, in modified form, at the 46th Aslib Annual Conference, University of Sheffield, 24th–27th September, 1972. The latter version is reproduced here.

NOW THAT so many current awareness services are available from outside the industrial special library, and internal SDI via computer is a reality in many companies, it seems likely that attitudes to the use of the 'information bulletin' concept as a means of dissemination will have changed. To get some idea of the trend, facts and opinions were solicited from librarians and information officers.

The survey was in the form of a letter (reproduced in the Appendix) which set up the hypothesis that the information bulletin might be on the way out, and invited librarians to answer a number of questions about their own bulletins and alternative dissemination methods. Their opinions on the future of the information bulletin in special libraries in the face of commercially-available current awareness services were invited. The letter was sent to 150 special libraries in the UK, and about one hundred replies were received. Coverage was industrial, technical and commercial libraries, and the libraries of research associations. Addresses from the *Aslib Membership List* were used, supplemented with lists from recent meetings attended by the author.

No definition of the term 'information bulletin' was given in the letter, it being left to respondents to interpret it as their habit dictated. For the analysis which follows an information bulletin was taken to be a library bulletin containing a high proportion of references to published articles or papers in the serial literature.

Functions of the bulletin

It was generally acknowledged that an information bulletin was to provide a current awareness service, in particular to keep staff informed of items they might not see in the course of their own reading: 'our bulletin is designed to bring about the maximum contact between relevant literature and the scientist or manager, with the minimum expenditure of effort on his part'. A daily digest from the press was intended to enhance current awareness by providing readers with information across a broader field than their speciality. An information officer in a small commercial library commented that a daily abstracts bulletin seemed the ideal solution to the complaints she received from people wishing to read the newspapers and discovering that the most interesting articles had already been removed for the library files!

One librarian expressed the hope that his bulletin would eliminate unnecessary reading by his customers. Several have introduced abstract bulletins to correspond with an enforced reduction in journal circulation.

In a multi-locational situation where customers do not necessarily live in the same building as the library, a current awareness bulletin is of particular value because the further away a person's place of work is from a library the less he is inclined to visit it.

Three of the replies to the question on the function of an information bulletin display insight into hidden roles of the bulletin:

> 'A regular bulletin helps to maintain a steady rhythm of work.'
> 'A good bulletin is an advertisement for the information department.'
> 'The information office carries round a mental picture of the overall interests of the firm, and departmental workers tend to have a limited view. The bulletin reflects this overall picture, and helps to spread it around.'

Bulletin costs

The letter did not include a question about costs, but four respondents supplied details of the cost of their bulletin. Two of the bulletins cost about 10p per copy or £1,200 a year; the others cost in the region of £1 per copy or over £10,000 per year.

In the first case a weekly bulletin of short abstracts of periodical articles and new books added to the library was compiled by the chief of the department scanning journals and marking items. His two assistants wrote abstracts on cards, which he then checked. The cards were arranged in subject order, details of books and reports added and the material given to a typist to prepare offset masters. The cost of these people's time, and that of printing and distribution was £23 for 250 copies per week.

The second bulletin operation produced a general bulletin of annotated titles, thirteen specialist supplements and a number of notes to individuals each week. Several copies of a Kwic index were obtained from the same input as the bulletin. Seven information scientists did the scanning, marking the parts of the title and text of each item to be used and adding or marking indexing words. The items were punched into cards which were then run through the computer to produce a set of cards to give offset masters, and separately a Kwic index. Costs for time and materials were £200 per week.

The SDI bulletin/index system was from the information section of a large industrial research laboratory having customers doing anything from basic research to empirical testing of products.

Feedback on use of bulletins

Fifteen respondents had some feedback on the extent to which their bulletin was used. This was usually obtained by counting photocopy requests. In general about a third of the items put into bulletins were requested.

Four librarians had done user surveys in the last year or two; one mentioned personal contact as a way of getting feedback on relevance and readability.

In one case, a fortnightly bulletin of brief indicative abstracts, nine requests were received for every article abstracted. This bulletin was 'axed as an economy measure' two years ago. It was difficult to see why, because the bulletin was produced in a most economical fashion at about 10p per copy once a fortnight. However, the resulting fortnightly photocopy cost of £97 may have been a contributory feature!

Title-bulletin or abstract bulletin?

Of the bulletin samples received, forty-five contained abstracts and twelve had titles or annotated titles.

Title bulletins are quick to prepare but serve mainly to announce that something is available—their information content is usually minimal. From the customer's point of view, it amounts to reading a title, deciding whether to ask for the original, reading the original.

Quite a heavy photocopying load can result from a good title bulletin and one respondent finds he can cut the number of requests by attaching to his title bulletin copies of the full text of all the shorter items picked during compilation of that issue.

Titles or annotated titles are used in preference to abstracts when the information system uses one input to produce both information bulletins and an index. There were three such cases, but several other librarians said that they were planning such a system.

Abstract bulletins take longer to prepare—there is usually a scanning operation followed by abstracting by another person, whereas annotation of titles and marking of keywords for an index can be done during scanning. On the other hand, an informative abstract can make reference to the original unnecessary, and 'not only is the reader able to judge which items he really needs in full (thereby reducing the photocopying chores) but also particular, though minor, aspects of the item can sometimes be highlighted because of their significance for the company'.

No information bulletin

There seems to be a trend towards libraries stopping bulletin production because of cost. Of the eleven respondents who had actually ceased bulletin production recently, nine mentioned cost as a contributing reason. Four of the eleven have replaced bulletins by secondary publications bought in from outside.

About a quarter (twenty-two) of the respondents do not produce an information bulletin. Eight of these do no scanning but rely on outside sources. Six do some SDI in-house. One man said that he produced no bulletin at the moment, but that recently his customers, for whom he has been running a manual SDI service for some time, have suggested combining some profiles into a bulletin for everyone! Four of the libraries who produce no bulletin seem to have been involved in mergers or takeovers, or have suffered the loss of their librarian. One organization has not retained its bulletin because 'we do not think the cost would be justified'. Instead they have a journal scanning club with nominated abstractors or the technical staff, who pass on abstracts to other interested parties, and also index them on feature cards.

Some other no-bulletin situations are described by the following extracts from replies to the survey:

> 'There was difficulty in covering all the journals in time for the bulletins to get to the customers before the journals did, so we cut out the bulletins.'
> 'Insufficient staff and probably insufficient need'—the librarian has one hundred qualified customers, and does journal circulation for current awareness.
> 'I have only thirty customers, and can provide a current awareness service by meeting them.'

The information bulletin and external services

Some of the questions in the survey letter were intended to bring out the changes in current awareness dissemination methods of special libraries which have resulted from the availability of so many outside secondary information sources.

Eighty-seven of the 102 respondents actually gave some sort of current awareness service; either by information bulletin, or personal contact, or an SDI system. Table 1 shows a breakdown of the eighty-seven by subject group and industry. The sample covered a wide subject area, and included commercial information units as well as technical and scientific information service, and several research associations.

Organic chemicals, polymers, plastics	20
Pharmaceuticals	14
Engineering & Electronics	12
Biological, Agricultural	6
Utilities, Services, etc.	6
Petroleum	3
Food, Consumer goods	8
Commercial information units	8
Research associations	7
Materials	3

TABLE 1: *Sample of 87 units giving a current awareness service*

The extent of the use of outside services as part of their current awareness service by the sub-set of eighty-seven units is shown in Figure 1. *Forty-nine units (56 per cent of the sample) made no use of outside services in this way*—they might purchase them, but they did not figure as part of a planned effort by the information service to use material from outside to supplement their own efforts. The forty-nine non-users of outside services were fairly equally divided among the divisions shown in Table 1, so that most commercial information units,

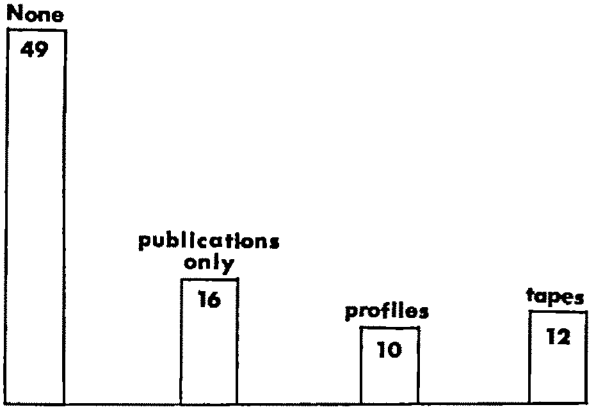


FIG. 1: *Use of outside services in current awareness system—87 units*

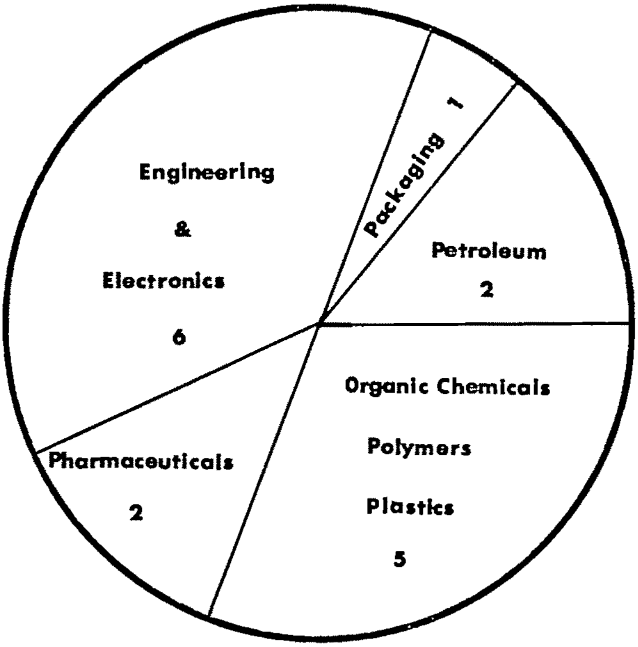


FIG. 2: *Use publications only—16 units*

research associations and consumer-goods purveyors did not use outside services in this way, but most chemical, pharmaceutical and engineering units did.

Respondents who did use outside sources as a part of a planned current awareness service are further subdivided in Figure 1 into:

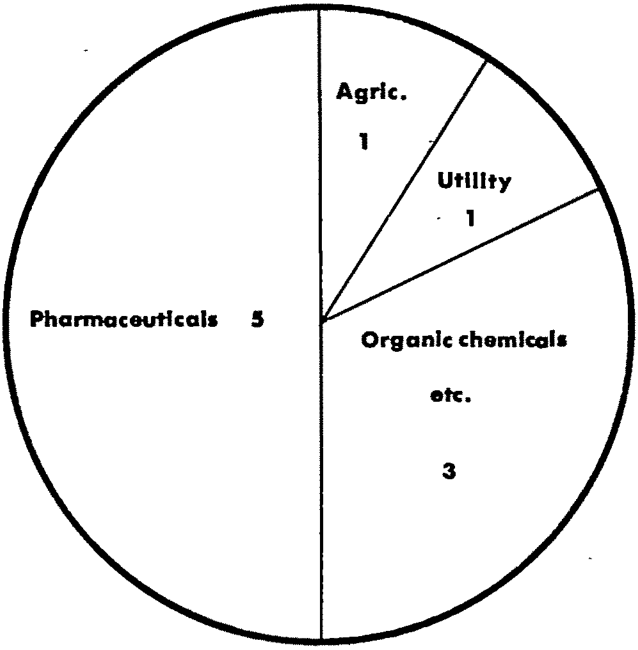


FIG. 3: *Take profiles from a bureau—10 units*

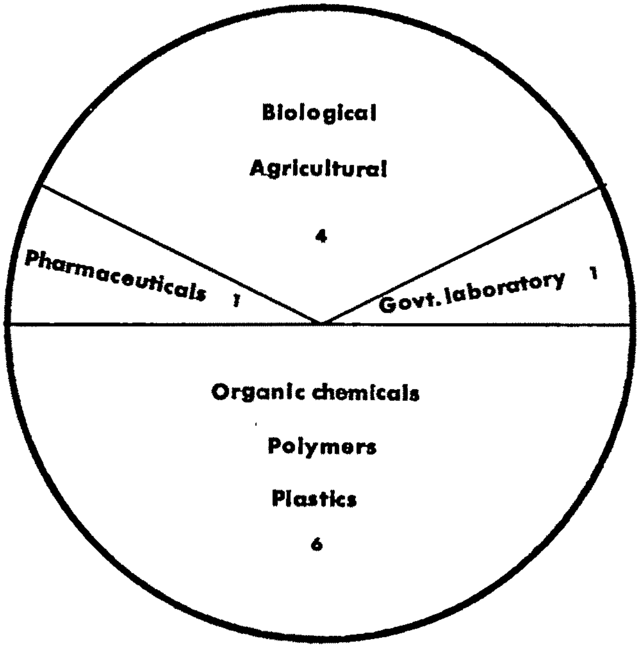


FIG. 4: *Search tapes in-house (12 units)*

Those who use publications only (16)—about 20 per cent of the sample;
those who use profiles from a bureau (10)—about 11 per cent of the sample;
those who buy tapes and search them (12)—about 14 per cent of the sample.

The pie charts in Figures 2–4 show to what extent information units in different subject areas/industries use outside services in these three ways. Certain broad conclusions can be drawn from the information summarized in the charts. For this sample, at this time, use of tapes searched in-house is greatest in the subject areas of organic chemistry polymers and plastics, and biological chemistry. Pharmaceutical units take more profiles from a bureau. In the field of engineering and electronics the use of published outside sources is more widespread.

Use of secondary publications from outside as part of a current awareness service

Librarians have always bought and made available secondary publications (abstracts and titles journals); what is new is a trend towards using them to give a current awareness service with the minimum scanning by library staff. Replies to the survey indicated that this might be done by straightforward replacement of a scanning/bulletin service with circulation of material from outside, by the use of outside sources to cut total scanning time because of the way they narrowed the field, or by direct use of material from outside in the departments' bulletins.

In specialized fields there is often a nationally or internationally-produced abstracts bulletin or abstracts journal which can be bought in. Several oil companies, for instance, buy and circulate the American Petroleum Institute's bulletins and abstracts. The librarians concerned do produce a small supplementary bulletin to cover specific interests of their customers. A librarian who had to abandon his scanning/bulletin operation because of cost was able to substitute circulation of an outside service of this kind. This was also the answer where a librarian was asked to supply a current awareness service for a subject in which he was not qualified.

Three librarians circulate the Derwent patents abstracts in lieu of preparing their own bulletin. Two information departments circulate *Current Contents* to research staff as well as supplying them with a computer SDI service. One information officer, who is prevented from maintaining a scanning/bulletin operation by shortage of staff, circulates multiple copies of *Current Contents* instead.

One librarian commented that, for his situation, the appropriate specialist service was very good, but supplied too much—he uses it therefore just to supply abstracts of articles from foreign journals. The bulk of outside services and their comprehensive nature leads many units to use them as a back-up to scanning those journals taken by the library. A typical outlook is that much of the volume of the abstracts publications which include a required subject area is of little interest, and would only make tiresome reading to the customers of the information service. The chore cannot be passed to the customers, so it is done by the information staff. Material most commonly scanned by the information group was abstracts produced by a research association; *Anbar Abstracts* were also mentioned in this connection.

Producing an information bulletin partly or entirely from abstracts supplied from outside was a fairly common approach. Eleven libraries used an outside service in this way. Five of these produce a patents bulletin by a cut and paste operation on the Derwent abstracts. Some research associations supply abstracts as unit records, and these can be used to compile an in-house bulletin. Two librarians had a bulletin made up for them by their research association from abstracts which they selected from the results of scanning about three hundred journals by the research association staff. Another information officer commented: 'An SDI service in bulletin form might be a formidable competitor to the home-produced effort.'

The problems which come with the use of external *published* services as part of a planned current awareness system are associated with their bulk, sectionalization and cost. Librarians who cannot make arrangements for sub-sets of externally produced abstracts publications to be supplied have to ask their customers to go through a comprehensive but very bulky publication, which cannot in most cases be used for distribution in lieu of a bulletin, because of the cost of large numbers.

One information department buys abstracts from an RA, *Current Physics Papers* and *Current Contents* as well as profiles on two computer SDI systems. The information officer comments: 'If a satisfactory match can be made between sections of an abstract or title publication and the research scientist's interests, then this is usually preferred to computer SDI. The more difficult the match the more suitable computer selection becomes.'

Use of SDI profiles run externally

About ten of the respondents who wrote about the use of SDI had obviously thought about and rejected the idea of individual profiles run by an external service. One reason was the difficulty of getting coverage of enough of the area of interest to make it worthwhile from the cost point of view.

> 'There is no service in the field covered by the library.'
>
> 'There is a service which goes some of the way, but a lot of weeding would have to be done.'
>
> 'Our range of interests is so wide that to use a commerical service would be much more expensive than to do our own current awareness.'
>
> 'We should have to use many of them to cover a reasonable part of our rather wide subject area.'
>
> 'External services do not cover product development and marketing.'

External profile SDI was compared unfavourably with the efforts of information staff working in constant contact with the customers; particularly where attention to detailed requirements and reaction to constantly changing interests were concerned. One librarian pointed out that machine SDI from tapes could not beat the scanning/bulletin system of dissemination for speed. Another pointed to the desirability of abstracts, in the face of machine systems that work best on titles.

Comments from librarians who actually used SDI from profiles run outside revealed a trend towards use of profiles for subject specialists, with bulletins to cover general interests. A survey of the value placed on current awareness bulletins by research scientists in a large industrial laboratory showed that 43 per cent felt a need for some other type of current awareness, viz.: greater depth of scanning to give higher subject specificity, and coverage of journals not taken in the library. As a result of the survey the information officer oriented the bulletins towards the general project interests of the laboratory, and SDI was obtained for individual interests. Another librarian used an information bulletin to cover the commercial aspects of innovation, while supplying SDI to his customers in basic research.

Two quite different approaches to the use of external SDI were exemplified by the manager (apparently not a librarian) who said that SDI distributed by the library and journal scanning by individuals satisfied all their needs, and by the librarian who had to abandon journal scanning because of staff problems, and now produces a technical bulletin from the items supplied by externally run SDI profiles.

Not everyone is happy with their first use of external SDI. Two librarians have started bulletins to replace the external service. One information department ran a comparison over six months of three separate data bases on the same subject area. Their conclusion was that they needed to use all three to get adequate coverage—not necessarily because of non-overlap but because of the limitations of profile construction with the various bases.

An interesting problem arises in a research library which uses profiles from five commercially-available data bases. Some departments are now saying that they wish journal circulation to stop. The librarian is naturally concerned lest this reduce the general awareness of the R & D division as a whole.

In-house SDI from tapes

The most versatile way of using the commercially available data-bases is undoubtedly to buy the tapes and run them on one's own computer. This approach gives the facility of running tapes from several sources against the same search, including tapes prepared from the company's own information files, and allows the possibility of retrospective searches of the files as well as current awareness.

Of the twelve information departments who wrote notes on their current awareness systems from in-house tape searching, eleven still retain one or more information bulletins. In the remaining case 'the information bulletin just faded away with the rise in SDI services'. Here a comprehensive SDI service is given to research scientists from three data bases. The information officer allows that bulletins, provided that they are cost-effective, can still be justified on the grounds that tape services do not cover trade journals. This applies, he says, more in a technico-commercial organization than in a purely research environment, where the demand is satisfied by the scientific journals.

Cases which bear out his view are departments which run computer profiles for many research or specialist staff but which also compile in one case five abstract bulletins and in the other two a single bulletin covering technical or technico-commercial items. That these bulletins are regarded as viable is obvious from the plans to introduce a system to produce bulletins and an index from the same input.

An interesting approach is production of SDI bulletins from data base tapes. 'There are indications that group profiles are the most cost-effective way for computer SDI.' One department is producing an experimental bulletin from tapes by selecting items of interest from hard copy issues of the abstracts, and arranging for the computer to print out a subject classified bulletin of titles.

In information departments with a strong scanning/bulletin operation the provision of computer SDI even from inside the department seems not to be so successful. An evaluation of Chemical Abstracts Condensates and Institute for Scientific Information tapes for an SDI service to scientists in a large research laboratory showed that there was little overlap between them and the weekly information bulletin, and the bulletin was rated better than the two SDI sources. The information officer from another department with a long record of successful bulletin and SDI services derived entirely from scanning feels that 'the best current awareness would seem to be careful analysis of the planned acquisitions of the library. A system of SDI bulletins has the advantage that the material is easily locatable for further reference, and there is enrichment of the titles during scanning, as well as providing already the SDI approach'. Although in-house computer SDI has been running here for several years, research scientists have shown no great interest in it.

The constraints which are operating to change the current awareness dissemination methods of special libraries

From the facts and opinions provided by respondents to the survey, it is possible to identify a number of the constraints which will affect future development of in-house dissemination systems.

- It is easier to get money than staff.
- Bulletin compilation using qualified scanners is a very costly business.
- Specialists prefer an in-depth SDI service.
- There are no data-bases on tape which can be used for many specialist areas, and tape services are poor in the commercial aspects of their subjects.
- To run an effective SDI service, a number of different tape services have to be used.
- Tapes cover mainly journals containing titled articles and papers and not the trade press and short announcements.
- Use of secondary sources like abstracts journals, or tapes through a bureau, as part of the library dissemination system is complicated by decisions about coverage and cost which are forced on one by the nature of the secondary source.
- Tapes are cheaper to use in-house than through a bureau.
- An in-house SDI system which will merge a company's own reporting information with material from outside is to be preferred.

A future for the bulletin?

From a study of the survey material it is possible to recognize a number of trends in the use of outside sources, none of which involves rejection of the information bulletin concept.

The rising cost of purchase of all the necessary primary literature and dedication of information workers' time to scanning it is causing managers of information units to consider how they can use outside information sources to substitute for the in-house activity. How they cope with the problem depends on the level of funding which their information unit has been able to attract.

The larger units are buying tapes and searching them for dissemination by SDI and grouped profiles. It seems likely that bulletin compilation by computer will be a component of this approach.

Medium-sized units are taking some profiles from the bureaux, but the trend seems to be away from this approach and towards the replacement of in-house scanning by SDI services and custom-made bulletins from the information sections of research associations and other specialist information centres.

In both cases dissemination of items on the commercial aspects of their subject areas is achieved by an in-house scanning/bulletin operation.

Despite the trend away from in-house scanning there are a number of highly successful current awareness systems based on qualified information staff scanning the primary sources with customers' needs in mind. They are, in fact, highly evolved information systems which developed before the advent of the commercially-available computer data-base. A comparative study of the costs and effectiveness of these systems and the systems based on in-house tape searching would yield valuable clues to future trends in dissemination methods.

At any rate, it seems that there *is* a future for the bulletin.

My thanks are due to the 104 librarians and information officers who helped with the survey by supplying details of how they use bulletins and SDI, especially to those who allowed me to see the results of in-house studies of dissemination systems or user needs.

Margaret Slater and Helen Townley gave helpful advice. I thank them too, but accept full responsibility for the outcome.

APPENDIX

THE SURVEY LETTER

It is currently rumoured that the information bulletin is on the way out. I want to collect enough information to confirm or deny this rumour, and would be glad of your help.

This is an area in which, so far as I am aware, no research has been done since that for Walker's excellent monograph, published in 1966. It would seem appropriate to supplement this basic work now, when commercial current awareness services are more various.

Any material, facts or opinions which you can provide will be used to build a picture of current usage of the information bulletin concept in special libraries. If I write up this enquiry, I shall deal in trends, not individual cases, and an expressed desire for systems or designers to remain anonymous will be respected. If you can help, please write to me on the following lines:

(a) If you produce a bulletin, tell me what sort of bulletin, and how it is put together. Please send a sample if you can. What functions do you see your bulletin fulfilling, and do these correspond with what it was designed to do. Do you produce an index to useful material which goes into the bulletin, and how is this done?

(b) If you do not produce a bulletin, please explain the rationale for this decision. If you have ceased bulletin production, please explain why. Do you provide a current awareness service in some other way—if so, how and why?

(c) Whether you produce a bulletin or not, how do you see the future of the in-house current awareness service in the face of commercial title publications and SDI services?

(d) Some idea about size and location of clientele would help put responses to the above questions in perspective.

Please accept my appreciation for any help which you can find time to give, even if it has to be just a copy of your bulletin.

Yours sincerely,
T. WHITEHALL
Information Officer

Brooke Bond Liebig Research Centre,
Blounts Court,
Sonning Common,
Reading RG4 9NZ.

Pilot studies in a multi-data base environment

H. J. Zwillenberg

Principal Librarian, Commonwealth of Australia,
Dept. of Supply

*Paper presented at the 46th Aslib Annual Conference, University of Sheffield, 24th–27th September 1972**

1. Introduction

THE COMMONWEALTH of Australia Department of Supply, an organization in some respects not unlike the UK Department of Defence Procurement Executive operates a number of research laboratories and factories, staffed by some 1600 or so scientists and engineers and employs 20,000 non-scientists/engineers, tradesmen, and the like.

About five years ago the need was felt to bring the documentation of the Department under some form of control and together with the Department of Army and some sections of the other service departments we created the Australian Defence Science and Technology Information System (ADSATIS) concept. The system now consists of an operational Indexing Sub-System accessioning annually about 40,000 documents flowing into the defence community, a Document Exchange Sub-System, so far operational for the Department of Supply only, and a Current Awareness Sub-System.

The Current Awareness Sub-System produces, operationally, current awareness bulletins, issued monthly to some four hundred or so people in the form of separate COSATI sections selected by them. Experimentally, we are engaged on SDI operations based on the data base generated by the Indexing Sub-System, by the US National Technology Information Service (NTIS) and by Engineering Index Inc. (Compendex).

The development of the Current Awareness Sub-System has been subject to philosophical, organizational and physical constraints. The philosophy of a service of this nature is based on the need to support Departmental missions and tasks rather than the subject interests of individual scientists—two quite different operations. Also, development on the national scene may affect the choice of data bases that the Department would finally wish to interrogate. The organizational constraints arise from the fact that the personnel engaged in the work belong to different organizational entities within the Department and, geographically, are widely dispersed, as are the hardware facilities which moreover, are almost totally incompatible with each other.

---

* An extended version of this paper is held by the Aslib Library and can be borrowed or consulted in the usual way.

2. The problem

The problem one is faced with within a multi-data base environment which is subject to the constraints just mentioned and which has to be solved before an operational system can be implemented, are

(a) the mode of interrogation;
(b) the type of the interrogation softwares;
(c) the machine facility best suited for the work; and
(d) the management and operational control aspects of the system.

The *mode of interrogating* data bases for SDI purposes depends on the type of subject profile-document matching approach and may either be in form of descriptor matching or in form of text processing. Descriptor matching experimentation is carried out at the Department's Aeronautical Research Laboratories (ARL) near Melbourne, where ADSATIS and NTIS tapes are matched against the profiles of some one hundred scientists. The other mode is text processing with which we are experimenting in Canberra, both with the NTIS and the Compendex tapes.

As far as the *interrogation software* is concerned we have, basically, two options. The first is the use of a standard package such as the IBM Textpac system. A standard package usually offers a wide variety of operating modes and one of our preferred data bases is already in Textpac format. On the other hand, standard packages like Textpac are very much hardware bound and often not inexpensive to operate. The alternative is an in-house designed package which has the advantages of low cost operations, simplicity of job scheduling, ease of operation and data preparation; on the other hand, its degree of sophistication is usually at a minimum as is the standard of output, and its versatility is, of necessity, usually very restricted.

Hardware considerations in an exercise of this nature, while naturally of some importance, are usually subject to factors outside the control of the system.

Management and operational control aspects include performance assessment of the system.

3. Feasibility and pilot study parameters

The feasibility studies undertaken in 1971 were designed to frame up the 'Build Standards' and included such aspects as choice of user sample, specification of input demand formats, verification of data base readability, refinement of interrogation processes, and means of assessing output responses.

Following the feasibility study, we commenced a few months ago with an extended pilot study based on user samples taken from a wider spectrum of operational environments than was the case in 1971, and the aim of the pilot studies, in addition to confirming the results from the feasibility study, has been to evaluate the best environment, loop effectiveness of the system and the potential organizational effort required to run a system of this nature as a full scale operation.

4. Descriptor matching

At ARL descriptor matching of ADSATIS and NTIS was based on TEST descriptors and has employed simple OR logic. In addition an element of AND logic has been incorporated by stipulating appropriate COSATI and SCIM categories. Also, the masking out of plural endings and of non-alphanumeric characters has increased the 'hit' rates.

The user population was *ab initio* scaled to an almost full scale operation because the intention of that particular establishment was to satisfy as many users as possible and as quickly as possible. The lesson that can be learned here is that in this area, as in many others, it is a cardinal mistake to scale up experimentation too quickly—the result is an early 'freezing' of conditions at a standard that might be acceptable, locally, to individual user groups but not to the system as a whole.

The parallel descriptor matching experimentation in Canberra on a wider spectrum of users confirmed what other workers in the field have found. For instance, we found it easier to amalgamate several simple profiles into a lesser number of complex profiles, or that infinite care has to be taken with truncations and word scopes and so on.

Descriptor matching experimentation of NTIS tapes has been suspended in Canberra, temporarily, because of lack of staff, but it is expected to be taken up later this year when we expect to have our text processing capability perfected to an extent that both descriptor matching and text processing can be compared meaningfully in respect of one tape.

5. Text processing

Text processing was the only practical interrogation approach to Compendex, just as descriptor matching is the only sensible way of interrogating the ADSATIS data base. The former has too few descriptors and the latter not enough text for meaningful interrogation by the alternative methods. NTIS, on the other hand, would be examined quite well by either mode.

Information requirements were often given in the form of descriptors which led to misinterpretation of such rather important aspects as the main field of interest, interrelationships of missions, acronyms, synonyms etc. and associated aspects. Because of the wide geographical dispersion of users, input explanations and comments regarding output have to be conducted by correspondence. Despite the inevitable delays the method has proved advantageous because written statements are usually more carefully worded and less likely to be biased in favour of the user's immediate and perhaps transitory interest.

Initially, the Textpac system had to be slightly modified to accommodate a larger size data base and to eliminate the 'stopping' effect of some of the print controls. Similarly, the documentation for profiling technique had to be corrected because of the often misleading and sometimes quite erroneous statements.

We attempted, unsuccessfully, to use the Compendex Card-A-Lert categories by themselves but expect quite advantageous results when building Card-A-Lert numbers into normal profiles containing words and phrases.

6. Suitability of software

No comments will be made here about the interrogation system developed at ARL, other than emphasizing that an in-house designed system often suffers constraints brought about by local conditions, particularly when designed *a priori* for a hardware-fixed operation for a finite number of users, rather than for conditions determined by the characteristics of the data bases.

Some comments might be of interest here in relation to Textpac, mainly on account of its international awareness and in respect of 'STAIRS', its next generation 'on line' version. Textpac is not a cheap system to operate and not an easy system to manipulate because of its sophistication, designed, primarily, to retrieve data from relatively unindexed data bases. Thus, in a descriptor matching mode, only some of the facilities are used, although the full power is being paid for. Also, data preparation is relatively expensive and a ranked (by relevance) output would be desirable but not yet attainable.

In a text processing mode, Textpac has exhibited superior characteristics, mainly, perhaps, because the design is geared to maximum complexity of profiles and because of the two ways in which the text can be interrogated, namely the Current Information Selection (CIS) and the Retrospective Search (RETRO) mode. For a volume of up to two hundred profiles, particularly in the 'build up' stage, the latter is preferable because of the diagnostic and 'statistical' facilities not possible with the former.

7. User reaction

User reaction is taken as a measure not so much of reaction of users as individuals, but rather as representatives of departmental mission and task areas. At ARL the reaction to the descriptor matched interrogation of ADSATIS and NTIS tapes has been almost universally favourable despite comparatively low precision ratios and correspondingly high recall (the latter was *not* measured). Users in that area were prepared to look at many more references—they appear to represent a type of a macroprofile—than has been the case in Canberra, where the maximum amount that users were prepared to peruse were print-outs of up to twenty-five references.

8. Evaluation

Precision measurements relating to the ARL descriptor matching process for the ADSATIS and NTIS data bases varied widely (0.4 to 0.8) for profiles where the number of terms did not exceed 15. For more exhaustive profiles, the precision ratings have been quite constant (0.7 to 0.8). Also, we found that precision ratios in respect of the ADSATIS data base were both higher and more constant than for the NTIS data base.

Descriptor matching of the NTIS data base via Textpac in Canberra was evaluated in a similar manner, and the precision ratios were generally lower than those found at ARL. There were a variety of explanations for this which tended to prove very little, except that comparing *two* competing systems by absolute measures, such as the well-known parameters of Recall, Precision, Fallout and Generality, is fairly meaningless because the assessment of the number of relevant items in the data bases is an almost impossible task.

Because a binary (Yes/No) decision by many of our users was often influenced by extraneous factors such as probable availability of the source documents, a knowledge of systems inadequacies or the way the profile was compiled, we have decided on using only a group of 'trusted' users, aided by a set of simple rules to guide their judgement, rather than randomly selected users. Secondly, we have developed by means of a 'set' approach a relative measure to compare the precision performance of two competing systems and an equally simple sampling technique to examine the data bases for their content of relevant document references, judged as such by a non-user group of 'arbiters'.

9. Costs

The feasibility and pilot studies as far as costs were concerned have aimed, for a variety of reasons, at a profile level of two hundred and the costs have been calculated on the basis of actual computer times and normalized data base sizes. They also include production or subscription costs of the data bases, but do not take into account profile building and/or profile maintenance.

The 1971 *feasibility* studies have suggested that the cost per profile per annum for the ADSATIS/ARL, NTIS/ARL, NTIS/Textpac and Compendex/Textpac data bases would be of the order of $58.00, $22.00, $87.00 and $96.00 respectively, and the cost of one retrieval reference would be 26–30 cents, 26–27 cents, 40 cents and 32 cents respectively. The *pilot* experimentation that commenced with Compendex about two or three months ago has shown that the annual cost/profile would be nearer $70 and the cost per retrieved reference on the basis of not more than twenty to twenty-five references printed out would be about 23 cts.

Pitfalls and problems

Helen M. Townley

Managing Director, IR Advisory Services
(H., C. and K. Townley Ltd)

*Paper presented at the 46th Aslib Annual Conference, University of Sheffield, 24th–27th September 1972**

MY ORIGINAL brief for this paper was to take, from the literature, examples of successful solutions of practical problems found in using external information services. This would have been fine if there had been any examples in the literature, but there were none that I found. No one has said in print what happens when tapes are held up for three months in a dock strike, or how much it costs to re-profile when the thesaurus is revised without consultation with the user, or how much extra work is involved when the record format is changed at short notice. No one has actually stated in public that he allowed two hours per profile and it actually required ten, or that the programming costs were three times as large as his (and his Computer Department Manager's) estimate. These things happen—but one naturally does not admit to them in print, even though by so doing one could be of inestimable value to one's professional colleagues.

So what I am going to do in this paper is to go through a kind of check list of some major problem areas. The first problem is one I have mentioned already—delays in delivery of tape. Who has suffered from it? What were its effects? How did you remedy them, and at what cost?

I'm sure many people have taken up a service before they are completely certain what they want. Corbett[7] tells us what we are inclined to forget, that the form of an information service to users is a function of the total environment: 'I doubt if any wide-subject-range library has yet resolved rational policies for core journal scanning and bulletin production combined with and related to mechanized SDI, and purchased bulletins or publications from specialist centres. Each environment has its particular problems and peculiarities of need, but more and more library/information systems are being obliged to experiment in this difficult area, where literature coverage, subject scope, timeliness, measures of annotation, customer education and considerable ramifications of organization and cost factors, are all involved.'

---

* *Post-conference note:* This paper was designed to elicit from the audience comments on delegates' own experience of some of the problems involved and the questions asked of the audience are included in the text. The time allocated for discussion of these problems was limited but I hope that those now reading it who have anything to say about their own experience in the areas I mention will let me know, so that, with Aslib's permission, a further paper giving more practical advice, may be published. H.M.T.

There are two environments: the macro-environment, into which the service is normally selling; and the micro-environment of the purchasing organization. Even for a tightly mission-oriented service, such as biodeterioration, there is a probability that there will not be a direct match between their macro- and your own micro-environment, and one of the hardest tasks is to decide rationally what degree of failure to match is acceptable to you. Can anyone in the audience, finding the service did not do what you expected it to do, tell us from hindsight what factor or factors you did not adequately take into account when you decided to take the service?

Mr Parker's paper (see *Aslib Procs.*, January 1973, pp. 4–17) has illustrated one of the highlights of this problem area—recognizing the differences between classes of user for different classes of service. It is apparent that the decision to subscribe to the ESRO/ELDO service was less 'right' than the decision to subscribe to the others; could this have been anticipated?

Another area of difficulty in the process of deciding 'which service' is the extent to which you need an interdisciplinary data base. For the well-defined mission-oriented requirement, there is little problem, but how—if you are working in a nice wide field like biochemistry—do you decide whether to go for CAS or BIOSIS.

A critical area to attack is overlap. There are a number of studies of the degree of overlap in journal coverage; I am only quoting one. Wood *et al.*[25] in an analysis of overlap in the lists of journals covered by BIOSIS, CAS and Ei, established that only 23.8 journals were common to CAS and BIOSIS—a smallish percentage, but in fact representing some 3,500 journals with, no doubt, biological and chemical joint interest; which must be at least ten times as many as you could scan for yourself in-house. So, until you have identified these common journals, you cannot make a decision on the grounds of coverage alone. Indeed if, as seems likely, these common journals are the ones that matter, it is not merely that you do not judge by coverage alone, but that coverage is in most cases irrelevant: what matters is the selection criteria used, and such things as the suitability of their indexing language for your purposes.

Further work is now under way to measure the degree of overlap in selection from these common journals, and this should be most rewarding reading.

Going back to this question of micro-environment, Lancaster writes[15] that the greatest dissatisfaction expressed by the users of EARS (Epilepsy Abstracts Retrieval Service) related to the coverage of the data base, not to the characteristics of EARs as a searching device. The complaint was: 'Not enough retrieved'. I wonder whether this is because EARS, itself covering a narrow field, operates within a narrow field (neurology) so that the bulk of the people interested in epilepsy papers were also interested in the wider field of the whole institution. Had they been a small group in a much more diffuse working environment, I suggest that this might not be their prime point of criticism and they would be very grateful for their special epilepsy coverage. Perhaps someone in the audience would like to comment on this point of the relationship between micro-environment and attitude to the service.

It is interesting to note that the growth in the number of documents covered by the indexing services is linear not exponential.[17] There is a noticeable, growing trend for specialized data bases by special interest groups, such as water resources and the Entomological Society, building special bases for special needs. There is obviously an economic influence at work here. Have you decided against one of the massive services and *for* a collection of the lesser bases (and I would include here the specialized *printed* services such as Virology Abstracts or a specialized SDC service)?

With regard to coverage, I wonder if, before you decide to use an external service in-house, you saw how far your own coverage went up the Bradford-Zipf curve, and how much you were paying to get extra coverage of that percentage of the literature? It is one of the bits of 'ISR folk-lore' (to use Cleverdon's expression in a different context) that better journal coverage is one of the reasons for buying in an external service. Yet it is implicit, especially in the very large discipline-oriented services, that to make the service as attractive as possible to as wide a range as possible, the coverage will have a very much wider range than is probably required by any single user. (And, incidentally, the indexing will be more redundant, by your own standards.) Have you looked at it in the light of how much money you are going to pay for information you do not want (and how much are you going to pay for storing it, too, if you are going on-line—in which case it might cost you hundreds of pounds a day)? And did you cost out carefully how much it would cost to search on someone else's (the service's) computer for the few searches that you could not cover already in-house? Comment—experience, not folk-lore—would be welcome on this point.

Further, you may be paying for coverage of known and acceptable journals with a view to selection of a certain kind of item, and then not getting that kind of item. Services vary greatly in the precision of their definition of selection criteria. One should make sure here whether these services select what they say they will select, and whether what they do select is all that you want from that journal. Scott *et al.*[20] have suggested a simple technique for comparing the service's selection criteria with your own.

Finally, of course, it is necessary for someone to find out at intervals whether the service is including the journals it says it is including. Virgo[24] gives a neat technique for checking on coverage and then goes on to say:

> When several references from the same journal were omitted from *Index Medicus*, it was suspected that in some instances whole issues or even volumes had missed being indexed. Although it was not practical to check this in every case, it was found to be so for at least two of the journals. *Acta Ophthalmologica* had three articles in close proximity to each other that could not be located in the author indexes of *Index Medicus*, although references could be found to articles appearing earlier and later in the same volume. On investigation it was found that the fourth issue of volume 152, 1964, had not been indexed. This represented an omission of 24 substantial papers. Similarly, when 16 of the references to articles in *Vision Research* could not be located in the *Index Medicus* author indexes, the whole volume was checked to see if all articles had been omitted for that year. It was found that, although volumes III and V had been indexed, none of the 53 articles in volume IV had been indexed.' [*Quis custodiet ipsos custodies?*]

She reports that the National Library of Medicine immediately rectified these particular omissions, but one cannot help feeling that what has happened once can happen twice. Did it happen to you? So when you are considering buying any service, look carefully into, *inter alia*, the service's own arrangements for checking on its work.

As the question of the indexing techniques used by the service is so relevant to your decision on whether to buy or not, I am putting this question aside for the time being. But assuming that you have the coverage required and an indexing system that promises the right levels of recall and precision, you must consider beforehand the amount of item information you are buying. Batten[3] said on one occasion: 'Unless the user is satisfied with what I call minimum item identification—that is to say, the minimum characters that enable him to go to a page in some printed publication or other—then assuredly the computer costs will be some 60% of the total. But as long as he will take minimum item identification and go and use the library for his relevance search, then the computer costs within that profile will go down to about half what it was before. For, so long as we are tied to computer printers as a way of printing out search output, the printing is about half the cost of the total job'.

At one organization recently, the interesting comment was made: 'It's not the choice of your first external service that's so difficult, its the choice of the second and subsequent.' Any problems you may have with your first service are, indeed, child's play to those that arise when you decide that it is time you looked for a supporting service. Are you going to try to make service B compatible (in terms of your handling it) with service A, so that you put the same profiles to both bases, or are you going to have to write each profile twice, once for each base, or make the decision that Bloggs can only have a search of service A's tape and Boggins can only have a search of tape B, these being respectively the most likely sources of Bloggs' and Boggins' information?

What are you going to do about the overlap between A and B—carry out a long matching process and eliminate items in B already covered in A? Yes, but B's indexing is better suited to retrieval of Boggins' information and if you left him with only A's indexing, he would not be so well served.

Kabi[13] notes that 'very few in-house operational systems process more than one data base', and Corbett[7] states bluntly, following an earlier description of the proposed solution[6] that:

> Generally speaking, retrospective searching or indeed, current awareness, from multiple sources cannot be done locally on a machine basis. The first experimental steps are now being taken on merging data bases or alternatively searching several bases and merging the results. We could, for example, do the latter now by searching CT, INSPEC, NSA, GRA and BNB MARC for some subjects where all might give some references, then merge the results while eliminating duplicates. We already have some users taking output from several of these—but to merge them would be an expensive luxury. Again, some of us now have cumulations of our tape bases over several years. At this stage these are mainly investment. So far we ourselves have found little demand for retrospective machine searches, though the capability is desirable. Presently available procedures (batch processing) for doing such a search on more than one source or base are generally clumsy and time-consuming.

Tell[23] has presented a paper (unpublished, but worth getting hold of if this is a problem area you are about to enter) describing a free-text approach to reformatting input tapes from external services, and discussing the problems of lack of standardization of content of data as well as of duplication.

We must also remember that there is a cost problem in making the computer handle these various tapes. Hissinger[12] notes that a program to reformat one tape into a searchable mode is about £1,000 to plan, program and test. But the massive program capable of searching all these multiple bases, Teletext, took over six years and £40,000 to construct, and currently (1971) its annual development costs were £3,000 p.a. Bowman and Brown[4] had used four data banks at Dow Chemical Co. and have given a good cost analysis of the system. Finally, if you are taking on a new base, you have got to spend even more of your staff resources than you did with the first base in order to get the staff familiar with the differences between A and its indexes and B and *its* indexes.[19]

If, therefore, you are thinking of a second base, you have to take into account —quite apart from questions of coverage which involve problems of over-lap and duplication—the following:

indexing differences
coding differences
format differences
item representation differences.

There are, I expect, horror stories to offer on all of these points.

One of your problems, multi- or single-base, is getting the user brought into the picture. Rae[18] refers to 'basic problems' of educating the user to operate the system effectively (this was an on-line system) and raises the question whether the advantages of direct access by the computer are outweighed by the improved cost effectiveness of having a skilled intermediary.

But the user does need to understand why his profile is made up thus and you may well need to give more time than you thought to this aspect. Leggate[16] brings out the importance of training the user in understanding his data base, by pointing out the difficulties encountered in getting people to include a citation in their ASCA refiles:

> The most impressive feature of the ASCA system is the use of a citation index, which enables searches to be made for either cited authors or cited references. However, in constructing ASCA profiles, we have experienced considerable difficulties in explaining to the user how the system works and in obtaining from the user the most appropriate citations.

He quotes the experience of the National Science Library in Canada who in 1970 ran five hundred profiles against the ISI base, but only 40–50 of them made use of citations. He suspects that this under-use of citations is a result of lack of user education. He continues:

> Adequate use of mechanised services requires that individual users should know how the index system works, whether it be natural or controlled language. Profile construction involves the logical use of an index, whereas one suspects that most individual research workers, if they use indexes at all, use them in an intuitive, rather than a logical, manner. Thus, in a manual search, it is possible to skip from one entry to another as new possibilities present themselves during the searching. [I would add that one can do this also in an interactive on-line search.] In contrast, construction of a profile for a computer search

requires that the user rigidly defines the required index entries and the co-ordinations between them.

It is important therefore that the user should, as it were, know the basic principles of operation of the car he drives, how much more important is it that we, the garage mechanics, should know much more intimately the vehicles he is trying to drive. Does anyone feel, on looking back, that insufficient staff time and money was allowed for this important point? And, if so, can they indicate how much was allowed and how much *should* have been allowed? By practice, most people get a 'feel' for the printed information source; this 'feel' is much harder to get for a source on a tape and a conscious effort should be made—quickly enough to make sure that the base is not being misused and therefore wasting money—to get staff intimately acquainted with its characteristics.

Dr Simkins has drawn your attention to the fact that profile creation is costly. But your service is not going to be worth its money if you only run a few profiles. Hissinger[12] has suggested about four hours per profile to get it in order—which means a third of a man-year for two hundred profiles. Did you allow for this when budgeting the demands on your time made by taking the service? Personally, I would suggest that the time to get a profile really in order may well be a lot longer than four man-hours—and then it is usually just beginning to function correctly when circumstances make it necessary to change it again; and how many of you adequately budgeted the time required for profile maintenance? Kabi[13] remarks that 'The information specialist will devote his time [not, mark you, 'spend some time' but '*devote*' his time] to collecting feedback information from the users.' Can anyone give practical advice or offer bitter experience in organizing the collection and analysis of feedback?

Errors in profiling can lead to a disastrous user reaction. Barker[1] compared statements of interest and the resultant profile: in 40 per cent of cases only did the profile accurately represent the statement of interest. In 22 per cent of cases the profile was more specific than the question, and in 27 per cent the profile was less specific. He concludes—with some qualifications—that an obviously critical factor is the evaluation of the system, particularly its indexing; in relation to the needs of the user. The variables in operational systems, particularly those involving the human factor, are not susceptible of rigid control, but in general, complex search profiles show little improvement over simple profiles and there is possibly no necessity for sophisticated search facilities. While profiles of groups have common characteristics (for example, that some were very short and specific), this was not so much due to the environment of the users as to the fact that a single information officer had assisted in the preparation of all the profiles.

Lancaster, in a very recent paper,[15] gives a detailed analysis of some of the causes of failure in EARS, which is run on Excerpta Medica tapes. He gives four main factors affecting the performance (as measured by recall and precision), as follows:

- *Indexing*: (a) failures caused by indexing policy and (b) errors made by the indexers. These are faults attributable to the service, but with which you are going to have to deal.

> *Index language*: lack of specificity (especially likely in a controlled language); ambiguous or spurious relationships between terms (more likely in an uncontrolled language).
>
> *Searching errors*: use of incorrect or illogical strategies; failure to use language appropriate to the 'level' required by the user, giving too high or too low a recall or precision ratio; failure to cover all possible approaches to retrieval (especially likely with uncontrolled language or where the aids to searching are insufficient).
>
> *Inadequate user/system interaction* is a very significant source of failure in any *delegated* search (i.e. when the responsibility for the search is passed on to a human intermediary). It is rare in systems working in an on-line mode, he says, where the user can interact direct with the system.

He gives a number of examples of precision and recall failure, analysing the causes of each. This *and the Barker report*[1] are essential reading for anyone who has to design a profile or frame a search enquiry.

Virgo[24] has an interesting point to make on the aids provided by the service. Seventeen out of a test bed of twenty-three references were not retrieved by search on Index Medicus, though all were retrieved by search in Medlars. Though all seventeen used terms very similar to those in the statement of interest, the Index Medicus searcher had not been able to get at the precise words under which the concepts were indexed. The searcher in Medlars, using the Tree Structure available with MeSH, was able to get at the right terms and retrieved the documents correctly. The aids provided by the service are therefore an important and indeed essential part of the service, and should weigh heavily with you in choosing the service. In addition, I think you have a right to *expect* that the service will give you guidance until you are truly competent at framing profiles and searches in the system. However, this does not exempt you from being much more interested than ever you were before in papers on evaluation of a service, and on measurement of its search capacities, with analyses of the failures. Recall and precision used to be things that were talked of, most interestingly, at conferences, but which seemed to have little bearing on one's daily life. As soon as you start thinking about taking a service, and certainly before you start making profiles, they want to be made an intrinsic part of your professional armoury.

Leggate[16] and Virgo[24] also both go into some detail on search formulation and why certain formulations and classes of formulation give rise to failures in recall or precision. Leggate, remarking that most of an interrogated population said that Convenience and Time-saving were the two most important criteria on which to judge CT, goes on to say:

> On the one hand, therefore, in order to get good profiles, we might wish to do away with information officers or liaison scientists and let the user do it all himself (since natural text means that he knows more about the system's index language than does the system expert). On the other hand, if this involves the user spending five or six hours a week on his profiles, it is very doubtful whether he will judge it to be more convenient than his present conventional manual methods. A compromise is necessary—we want a reasonable division of labour between an information officer . . . and the individual user. We must therefore ask (i) how can this labour be best divided, and (ii) what aids are required and what aids are provided.

(In fact, Leggate goes on to look forward to the development of query negotiation languages—but without regarding this as a present help in trouble.) Perhaps someone during the discussion stage would like to consider what practical steps can, at the present day, be taken to improve our profiling skills.

I have already mentioned getting the user involved in the mechanics of the system. But before that ever occurs, you have another problem—to get him to think of the system as a practical tool to be used. Mr Parker's paper earlier indicates that the user thinks that the service he wants to have is the service most like that which he has been used to having. This emphasizes a point made by Cawkell that SDI services must be *actively sold* by the information staff, and not left passively around for people to use if they wanted to. Did you make provision for 'selling' the new service when you worked out the staff-time implications of this new venture?

Here I would like also to quote Cuadra[8] talking of the introduction of an on-line system:

> 'Users failed to explore the full range of capabilities of the system, even though use of the computer was free. In part, this was probably because the training that had been given, even though it had been extensive, was too limited for the complexity of the system that they would be using. *But, more important, exaggerated expectation had made it difficult for them to maintain their motivation in the face of system adversity.*'

So there is another pitfall for you—tell your user how wonderful the new system is going to be, and you will disappoint him; fail to tell him enough about it and he will not 'buy' what you are offering. I would like to hear an industrial psychologist addressing himself to the problem of getting a user safely and confidently eased into the new age of information services. But, in the meantime, who has any advice to offer us on this point of user indoctrination and training?

One of the subjects I had thought to find much discussed in the literature, but which seems to have been little considered, is the effect on the overall information system of an organization of introducing this new giant service. Mrs Helliwell (see January *Aslib Procs.* and Mr Whitehall (see this issue) have today added about 200 per cent to the existing literature, I think. The whole daily round of journal buying, scanning, abstracting, circulating, etc., all make up a system unique to the organization (for no two organizations have the same system). Into this then is introduced the effect of several times the number of scanned journals. It *ought* to change, radically, the entire way in which the staff and the users are organized, affecting activities like journal purchasing policy, borrowing policy, the type of searches taken over from, or passed back to, the user.

Corbett,[6] speaking of AWRE, states that '50% of loans resulting from SDI have to be borrowed externally, and over 50% of those that were borrowed proved useful.' On the other hand, an information scientist to whom I was talking recently, produced the number of external borrowings made by his laboratories over the last six years, the last two covering the period of introduction of a commercial information service and the creation of about seventy profiles. One would expect the graph to show some sort of kink at this part, but in fact, it is linear—just a nice straight line moving steadily higher as year succeeds year. Why? It is not a curve that mirrors the literature growth, which is exponential, so that cannot account for it. Is it because the new data base was not as relevant as all that, or that the activities of the research scientists were independent of those of the information department? Or had the information scientists previously been doing such a good job that no change in user borrowing resulted, in which case, why take in the new service? Speculation is idle, especially since I have found no other items of evidence save these two. What is the effect of the service on borrowing loads?

This whole area of systems compatibility is unexplored. What is the impact of the service on your own information and communication system? I would like to distinguish sharply between those of you who have bought information tapes and are using them in-house, and those who are using the service's facilities by putting profiles of retrospective searches up to them, while maintaining, to some extent, your own normal routines.

In particular I would like to hear comment from those who use the only two (to my present knowledge) services which do cover-to-cover search of the named journals rather than select: ISI on the one hand, the massive computer-based service, and SDC on the other—a service which gives 'minimum item identification' but at a cost very appreciably lower than most information services.

Does anyone file SDC cards in the information centre? If so, how much effort do you have to put into giving them subject headings to make them compatible with your own records? Or have you found it best to subscribe to a particular service for a particular individual and let him organize the information himself?

What arrangements do you make for the recording of and the results of queries or profiles put to the service. Do you incorporate the results in your own records, or pass them straight to the scientists and let him organize them himself?

Also, what changes in your organization have been effected as a result of having a machine do your 'donkey work' for you. Mrs Helliwell has commented on the extra time available for using the information staff for searches. I assume this means that the job functions of the staff have changed too—from more routine searching, leaving the users to do the relevance assessment and the evaluation of the output, to a search-assess-evaluate task for the information scientists. What effect has this had on your wages bill, and on the distribution of tasks between staff? Are you tending, perhaps after a couple of years, to employ more subject specialists within the disciplines of your organization, rather than information scientists with wide but shallower subject knowledge? All of these seem to me to be possible effects on the organization, and few have been tackled in the literature.

I would like also to spare a minute to consider equipment compatibility. I know of people who have put their Derwent cards on to tape for quicker searching; I know of people who take a tape service, do a selection run on it, output in detail and then use the output for a manual system. What are the problems that lead to this kind of solution being accepted, and what problems presented themselves in effecting this solution?

With a publishing medium like tape, one is much more susceptible to errors and changes in format, so, since we are concerned almost entirely with tape services, I would like to consider software and hardware problems. You can get your searching—CA or IR—programs from the computer manufacturer in some cases, or from the service. Manufacturer's software tends to suffer from its attempt to be all things to all men; or it is, on the other hand, so specific that it will handle MARC formats but nothing else. What programs have you used, on what bases, and with what sort of result?

Mrs Helliwell obviously had some problems with program maintenance. She is not the only one who has used computers without being trained to use them. This applies to most of us; and when the program does not behave as we expect it to behave, we are flummoxed. What sort of problems in this area have been met, and how were they solved? How much instruction was given at the beginning, when you took the program, on how to use it? User's manuals vary a lot in quality, and you must do everything you can to ensure that the information in the manual is supplemented by informal or even formal instruction in how to use the program. Has anyone been put off by being told that their computer people will understand the manual and all will be well—and then found that they did not understand it? About six months ago I was given the manual of an IR system and was unable to make head or tail of it, and nor was my colleague, a very experienced programmer in a variety of programming languages and an expert on the machine for which the program was written. Do not be afraid to say, loudly and repeatedly, that you have not been given enough information.

One of the things you will need help on from your computer people is how to tackle retrospective searching; Heaps[11] in a paper at Cranfield 2 gave a poignant reminder of a fact of life. If he had continued to use, to search over 5 years of tape for one query, the same technique he used for SDI, the cost per query would have been $500! The problem of putting two hundred—or even only fifty or sixty—profiles to a data base of only one week's worth of information, is completely different from that of putting one or two queries to five years' worth. You can almost certainly do the current awareness search better and cheaper in batch mode on a serial file. The retrospective search almost certainly needs individual matching against an inverted file. This is one of the developments you ought to anticipate. If you have any thought of using your tapes as a retrospective search tool, you should, from the very start, think how you want your files organized for that purpose, and get the weekly tapes first run against the SDI program and then re-formatted into the retrospective base. Part of the difficulty here is that too few systems analysts have experience of designing information storage and retrieval systems, and without guidance, probably from you, they are likely to design a very primitive tool. I expect you can offer more horror stories on this point.

Another of the things you have to anticipate is the format of the tapes you will be purchasing. Attempts at standardization have been pretty unsuccessful to date, so it is as well, when you buy or design the program for your first service, to bear in mind what will be its likely successors and try to design an SDI and search mode into which all can be adapted at relatively little cost.

The service may say that they sell tape compatible with such-and-such a machine series, but that only means that it can be read without a translate program having to be written to change one pattern of bits representing, for instance, the character A, into another pattern of bits. It does not mean to say that the tape can be searched by the SDI and IR programs put out by that manufacturer. This is a pitfall which I know many libraries have encountered.

So can anyone say whether they did suffer extra expenditure of time and money beyond what they had anticipated in (a) making the second service compatible with the first and (b) making the received tapes compatible with the first, with the computer itself and with the software that was to be used or was already being used?

I don't want you to get the idea that all computer-based systems take a lot of time and money to set up and run. Byrne[5] reports on a simple SDI system to work on INSPEC (MARC) tapes on a 360/44 which only took eight man-months and about one hundred hours' computer time to develop. Dammers[9] has also estimated that at Shell, Sittingbourne, the cost per run/measured in man-hours, which was 2–3 in 1967–68, would be down to 0.7–0.8 in 1972.

But I do want to make it clear that if you are designing a system for SDI and IR, over a large data base, and drawn from more than one source tape, then the task will be very costly.

This is true especially if you think you want to go on-line. One of the problem areas is the estimation of the amount of expected usage: time-sharing is obviously cheaper for any one enquirer, but if you underestimate the number of enquiries, you can find the cost per enquiry running way beyond your purse. The Scan system, for instance, used to be only economic if a steady pace of seventy queries an hour were processed. The cost of keeping a large file on tap all the time is terrific—Cuadra[8] states that the 1971 MARC file, which occupies 2½ IBM 2314 discs, costs $600 a day to keep on line.

But even if you are batching your searches, I wonder if anyone would like to comment on experience in deciding whether to take tapes and search them in-house, or to put enquiries to the information centre. Perhaps some of the service suppliers might like to comment here on the principles which should guide such a decision.

A final point, which does not seem to fit into any other part of this paper, but which I feel I cannot leave unmentioned, is the fact that the magnetic tape era has introduced a change in the secondary printed publications. More and more the trend seems to be towards specialist secondary publications, by-products of tape service, with a gradual decline in the growth rate of the massive secondary journals. Is this a factor which we ought to bear in mind when we are planning future developments of our own in-house services?

It is my earnest hope that many, many people will be prompted by this paper to come forward with their own experiences. I am certain that there is a vast amount of valuable information about these problems, tucked away under the carpets of a vast number of information scientists. This information is certainly overdue and should be brought out into the open, for indeed it is not dust, but a light for a dark place.

SHORT BIBLIOGRAPHY

1 BARKER, F. H., KENT, A. K. *and* VEAL, D. C. Report on the evaluation of an experimental computer-based current awareness service for chemists. *JASIS*, 23, 3, March–April 1972.

2 BARRETT, J. W. Subject- and mission-oriented schemes: the international patterns indicated by CAS, INSPEC, INIS and others. *Aslib Proc.*, **22**, 8, Aug. 1970.

3 BATTEN, W. E. External information services and the small user. *Aslib Proc.*, **23**, 10, Oct. 1971

4 BOWMAN, C. M. *and* BROWN, M. T. Current awareness services in industrial organisation. Presented at Am. Chem. Soc. meeting, Chicago, Oct. 1970.

5 BYRNE, J. C., CURRIVAN, P. J. *and* MAHON, P. V. A current awareness service based on INSPEC tapes. *Inf. Stor. & Rtvl.*, **8**, 4, Aug. 1972.

6 CORBETT, L. Progress at AWRE in the development of mechanised current awareness services. *Program*, **4**, 4, Oct. 1970.

7 CORBETT, L. Problems in using external information services: attitudes of the special library and its users. *Aslib Proc.*, **24**, 2, Feb. 1972.

8 CUADRA, C. A. On-line systems; problems and pitfalls. *JASIS*, **22**, 2, March 1970.

9 DAMMERS, H. F. SDI: some economic and organisational aspects. *Aslib Proc.*, **23**, 10, Oct. 1971.

10 DIXON, M. D. The storage and retrieval by computerised systems of chemical information by Derwent Publications. In: *Symposium on Computer-based Chemical Information*, Noordwijk, November 1968. Royal Netherlands Chem. Soc., 1970.

11 HEAPS, H. S. *and* THIEL, L. H. Optimum procedures for economic information retrieval. *Inf. Stor. & Rtvl.* **6**, 2, June 1970.

12 HISSINGER, B. A multi-disciplinary and computerised SDI service for industry and research. *Inf. Stor. & Rtvl.*, **7**, 4, Nov. 1971.

13 KABI, A. Use, efficiency and cost of external information services. *Aslib Proc.*, **24**, 6, June 1972.

14 KENT, A. K. U.K. Experiences in the operation of a storage and dissemination service based on the C.A. search tapes. In: *Symposium on Computer-based Chemical Information* (see 10 above).

15 LANCASTER, E. W., RAPPORT, R. L. *and* PENRY, J. K. Evaluating the effectiveness of an on-line natural language retrieval system. *Inf. Stor. & Rtrl.*, **8**, 5, Oct. 1972.

16 LEGGATE, P. Problems of the individual users. *Aslib Proc.*, **23**, 10, Oct. 1971.

17 PARKINS, P. V. *and* KENNEDY, H. E. In chapter on 'Secondary Information Services', in: *ARIST*, **6**, p. 248.

18 RAE, P. D. J. On-line information systems: experience of the Parkinson Information Centre in using the SUNY bio-medical communication network. In: ASIS Annual Meeting *Proceedings*, **7**, p. 173 (Oct. 1970 meeting).

19 ROBINSON, F. Problems of using external services for retrospective search. *Aslib Proc.*, **23**, 10, Oct. 1971.

20 SCOTT, E. J., TOWNLEY, H. M. *and* STERN, B. T. A technique for the evaluation of a commercial information service. *Inf. Stor. & Rtvl.*, **7**, 4, Nov. 1971.

21 SCHEFFLER, F., MARCH, J. *and* BERNARDOS, I. An experiment to study the use of Boolean NOT logic to improve the precision of SDI. *JASIS*, **21**, 1, Jan–Feb. 1972.

22 SMITH, C. L., HERR, J. J. *and* WAKERLING, R. K. An SDI system based on NSA Magnetic tapes. In: *Proc. International Atomic Energy Agencies*, 1970.

23 TELL, B. V. SDI: an experimental solution to the compatibility problem. Unpublished.

24 VIRGO, J. A. An evaluation of Index Medicus and MEDLARS in the field of ophthalmology. *JASIS*, **21**, 4, July–Aug., 1970.

25 WOOD, J. L., FLANAGAN, C. *and* KENNEDY, H. Overlap in the lists of journals monitored by BIOSIS, CA and Ei. *JASIS*, **23**, 1, Jan.–Feb. 1972.

DISCUSSION

DR D. J. CAMPBELL protested against the use of the term 'manual scanning', which strictly meant 'scanning by hand'. He preferred the terms 'personal scanning' or 'human scanning'.

DR V. BISKE (Burmah Oil Trading Limited), said that it appeared alarming that the users seemed little concerned if their work should be duplicating that of others. This was perhaps because the users were research students, who were working for their Ph.D.'s and the fact that their research duplicated other work did not affect their academic success. Their attitude might be otherwise in a commercial as distinct from a scholastic environment.

He asked MRS HELLIWELL if the patent search carried out by the aid of mechanized and personal searches extended back for the full statutory fifty year period, or was it considered good enough to go back twenty or thirty years and rely on the official search by the Patent Office to turn up older citations, if any?

Everything said in the sessions so far emphasized the importance of precise titles for publications. Could editors be persuaded to give this point greater attention than sometimes now appeared to be the case?

MRS HELLIWELL replied that searches were taken as far back as was necessary, up to fifty years if there was need.

MR P. NEWMAN (Fisons Limited), asked DR SIMKINS if he could say which secondary services he used himself and how they matched up to his criterion.

DR SIMKINS said he did not altogether practise what he preached. He used the following services: *Science Citation Index*, *ASCA*, *Chemical Contents*, *Chemical Abstracts*, *Ringdoc* (the most used of all), and *Current Abstracts in Chemistry*.

MR A. E. CAWKELL (Institute for Scientific Information) said that Dr Simkins' statement that 'abstracts are best' needed some qualifying. From the rather small amount of available published information it seemed that the cost of creating an average abstract was at least twenty times the cost of inputting an average title. The cost in user's time spent in digesting an abstract was also much larger than that spent in digesting a title. On a cost-effective basis he doubted that an abstract was superior to a title. It would hardly be feasible to provide an SDI service with notifications in the form of abstracts, which compared favourably for timeliness or coverage with any large SDI service. Costs rapidly multiplied since, in addition to input costs, storage and search costs would be enormous.

DR SIMKINS replied that he agreed about the costs, but he still thought that an abstract was worth it.

MR B. T. STERN (Wellcome Foundation), said that abstracts were originally intended to help the readers decide whether to read the original papers. If titles or expanded titles were used as such indicators they might be sufficient and the use of abstracts as full text alternatives was probably not their intended use.

MR A. E. CAWKELL recommended that anyone importing magnetic tapes regularly should negotiate a 'Custom's Board Order Number' which must be conspicuously shown on all packages. To obtain such a number it was necessary to satisfy the Head Office of Customs and Excise that the content of the package would always be as described, and was not dutiable. ISI tapes were imported into the UK market with this number, and since its inception regularity had been similar to that of any in-coming parcel.

MR L. CORBETT (Stirling University), added three items to Miss Townley's bibliography:

(1) KENT, A. K. Problems of remote processing of magnetic tape information files. *Aslib Proc.* 20, 11, November 1968, p. 502–8 (deals with several problems mentioned by Miss Townley).

(2) SEARLE, R. H. Human versus machine selection for current awareness in mass spectrometry. *J.Doc.*, 26, 3, September 1970, p. 221–9. (This discusses and analyses the supplementation of human scanning of a subject's core literature by use of external services including mechanized SDI.)

(3) CORBETT, L. Using commercially available literature tapes for current awareness service. *Inf. Scientist*, 2, 3, November 1968, p. 83–102. (This is a fuller paper than the progress report, No. 6 on Miss Townley's list, and quotes early US papers like Bob Freeman's, giving practical experience of running tapes, touching on pros and cons of title alerting; labour and costs; 'second response' user judgement of relevance (precision) with indicative figures of borrowing effects on the library.)

MR CORBETT mentioned the frustration of a regular service on GRA (Government Report Announcements) at AWRE. Though the Canadian search system used was already running three other tape bases, and code translation and edit/reformatting of the tape content was done, tested, and SDI service given, because of quality defects in the source tapes, and of reading problems on IBM equipment, over 40 per cent of the tapes received could not be run.

He also emphasized that for detailed practical information in this field it was necessary to consult/join such experienced operators as the members of EUSIDIC (European Association of Scientific Information Dissemination Centres).

A speaker who wished to remain anonymous said that his organization had had the experience that, although it might be advisable to start off a service by buying programmes, it proved to be a wrong decision in the long run, when the programmes did not really do what they had expected them to do. They had to design their own programmes and expected that these too would only last a few years because then new ideas would have come up.

MR P. J. WAY (Esso Petroleum Research), said that searching via AIP tapes was used for launching searches in tens rather than hundreds. Studies had indicated that they needed to ask for searches in hundreds rather than tens to justify using tapes.

MR CH. L. CITROEN (European Association of Scientific Information Dissemination Centres) said that EUSIDIC had proposed an information interchange format for data bases on magnetic tape. It was intended to support and expedite the interchange of bibliographic material among members of EUSIDIC. In this way it would be possible to use general search programmes that searched tapes without prior reformatting or conversion. It was hoped that tape suppliers would adopt this format for their products. Also, if sufficient interest were expressed in a certain tape in a different format, one information centre could decide to convert this tape into the EUSIDIC format and then distribute this converted tape to other members.

Manpower Implications

SKILLS REQUIRED TO SELECT, INTERACT WITH AND EXPLOIT EXTERNAL SERVICES TO FIT THE USER'S NEEDS

John S. Rippon

Head of Information Services, Metal Box Co. Ltd

Paper presented at the 46th Aslib Annual Conference, University of Sheffield, 24th–27th September 1972

SO-CALLED EXTERNAL information services are not new but in recent years they have taken on new dimensions. Because no industrial information service can be self sufficient, it has always been necessary to draw on outside sources to obtain references, documents, data, information and advice that will augment what can be supplied using internal resources.

Advances in mechanized data processing have led not only to improvements in the conventional abstracting and indexing services but also to radically new forms of alerting and retrospective searching service. These far-reaching developments in the available scope and variety of reference-locating tools are causing a marked change in the emphasis of industrial information work towards even greater reliance on bought-in services. Learning to make the best use of these facilities has brought new problems which are, perhaps, experienced most acutely by those information units serving broad multidisciplinary areas.

In the present economic climate, industrial management is particularly anxious to get the best possible return on their investment in information provision and utilization. Information managers are equally concerned to ensure that their budgetary allocations are apportioned among staff, materials, equipment and services in such a way as to maximise cost-effectiveness. Owing to the greatly increased range of options now open, the cost-effectiveness equation has become very complicated and, therefore, much more difficult to balance. Unfortunately, there is also a large measure of uncertainty in the values to be assigned to some of the variables involved. Now, I am not an economist and I have only a rudimentary knowledge of accountancy, but it seems to me that if you try to assess the cost-effectiveness of real-life information systems solely in terms of those elements that can be readily measured, you may arrive at some very misleading conclusions. I do not mean by this that we should not continue to make the most strenuous efforts to determine the costs and performance of alternative systems and to relate these in ways that will enable us to choose the optimum combinations to suit particular circumstances. However, we cannot afford to neglect what are perhaps the most crucial factors, those of human needs and capabilities and I don't believe we can yet cost these in any meaningful way.

My aim in this paper is to look at some ways in which industrial information specialists and their users react to, and interact with, external information locating services.

You may have noticed that I have tried to avoid employing the term 'external information services'. This is because although most of these services are designed to aid us in the task of finding needed information, either currently or retrospectively, few of them actually yield directly usable information. Those that do fall into two classes. Firstly, there are data-compiling services that assemble simple facts or numerical values, often in regularly updatable form, on cards, in bound volumes, or on mechanically searchable microfilm or data tapes. A typical example is the Product Data service on microfilm supplied by Technical Indexes Ltd. This enables our engineers to compare the characteristics of electronic and mechanical components offered by a range of suppliers and to choose suitable sources for the products they require. It does not constitute a complete inventory of all appropriate manufacturers and their agents, but it has permitted us to reduce substantially the work of maintaining our own collection of trade catalogues and of tracking down product information. A further advantage is that copies of the indexes to the microfilm files can be issued to individual users to serve as an up-to-date buyers' guide which can be used independently of the rest of the system.

Secondly, there are a growing number of consultant organizations and commercial agencies engaged in gathering, repackaging and selling information in the form of technical, commercial or economic surveys on subjects of topical interest. By virtue of their international contacts and the use of personal interviews with their potential customers and with experts in the subject, the best of these enterprises can offer services that are beyond the scope of most conventional information centres. However, these are extremely costly undertakings, as is sometimes reflected in the prices charged, and in order to be sure of its profitability, this work is often carried out on a contractual basis for a number of sponsoring firms.

But not all of these services are of the same high standard and there is a danger that some firms will be enticed into paying extortionate sums for what appear to be very attractive products which could have been obtained much more cheaply by making proper use of the firm's own internal information resources. We do our best to assess the merits of any such services that apply to our particular fields of interest, perhaps by seeking the opinion of people who have sampled them, and would buy them only if we felt they could provide more useful information than we could acquire ourselves at a comparative cost.

These two kinds of service are particularly attractive because they demand the minimum of effort from the user who merely has to study the appropriate frames of a microfilm or peruse a printed report in order to assimilate the information he needs. The findings of Margaret Slater[1] in her report on 'Users and their demands' indicate that users in industry and government are, on the whole, prepared to devote less time to searching the literature than their academic counterparts, and that industrial users, especially those with administrative responsibilities, are more likely to demand information rather than documents or references and to rely on information staff to obtain this for them. John F.

Tormey,[2] an engineering executive at the North American Rockwell Corporation, examines nine causes of what he says is a readily observable condition, namely that the great body of engineers, scientists and technologists are barely sampling, much less habitually using, the modern indexing, classifying, analyzing and distributing machinery. Among the causes he cites are inadequacies in the systems and services themselves in that they are not yet adapted, or 'human engineered', to the average users' method of working; lack of encouragement by management to make use of them; and, in particular, pressures on the time of the average engineer, who is far too busy with the primary tasks of problem solving to take time for what he considers to be a secondary task of seeking help from the literature. Nor can these users find enough time to develop the skills needed to obtain full benefit from the new information facilities, which can, after all, be pretty tricky to use effectively, as I believe has been demonstrated by Lynch and Smith.[3, 4, 5]

Furthermore, this author suggests, as systems proliferate and become more specialized we may be approaching the point where sufficiently detailed knowledge of all of them will be beyond the storage capacity of the average user. What an understatement! I think most of us would agree that it taxes the ingenuity and patience even of the professional information worker to get the best out of the full range of tools he may have occasion to use. It is to be hoped that progress towards the standardization and coordination of different data bases and the achievement of compatibility in indexing and searching procedures will keep pace with the rate at which new services are being introduced, so that we can more readily gain, and retain, the competence to act as intermediaries between the systems and our users.

Many research scientists, especially those working in academic environments, are willing to make the effort to learn how to exploit some of the newer services and to employ a substantial part of their time in using these in order to collect information and keep up with developments in their field. It is highly desirable that they should involve themselves in this way. However, other members of the technical community are not so ready to engage in these time-consuming activities and if the task of acquiring information from literature sources becomes too burdensome to them they will either proceed without it or attempt to go about getting it in other ways. They already have available to them other channels for obtaining needed knowledge and renewing their expertise. These include attendance at conferences, meetings with suppliers and customers, visits to research institutes and consultation with other experts. In order to appeal to this group of users, external services must be easy to use, give a rapid response and turn up a reasonable number of useful references whose relevance can be readily recognized.

However, if the user is left to fend for himself, he cannot escape from having to give an appreciable amount of his time to (a) finding out which are the most appropriate services to use for any specific purpose, (b) compiling and modifying search questions or interest profiles, (c) assessing the output from various sources and selecting relevant items which should be acquired, and (d) examining documents supplied by the library and extracting pertinent information from them. Moreover, these tasks are often much more complicated than they sound, as perhaps I can show by relating some of our own experiences. I hope this will also serve to highlight some of the problems that may arise in seeking to deploy the human and financial resources of an information unit so as to utilize external services in the most profitable way.

Six years ago we were producing our 'Survey of Literature', a current awareness bulletin containing up to 8,000 abstracts per year tailored to our own needs and grouped under appropriate subject headings. Current indexes in sheaf form included a copy of the abstract with each index entry, so that when consulting the index it was immediately possible to determine with some certainty the relevance of an indexed document. The effort involved in editing and manually sorting the index entries to produce annual cumulations was considerable and at one time the annual indexes were appearing two years late. Eventually we were able to obtain programs which allowed us to sort the index entries in the Company's computer and to print them out in edited form on a tape-typewriter. The annual cost today of producing a specially-tailored abstracting service of this kind might well be in the region of £20,000. Moreover, because our interests range over a very wide multidisciplinary area, it could not by any means cater for the whole of our needs, so we also subscribed to about fifty published abstracting and indexing services, as we still do, at a cost of some £3,000. A large part of our 'Survey of Literature' was concerned with aspects of food and packaging technology which up to that time were not adequately catered for by outside services. When, therefore, IFIS brought out *Food Science and Technology Abstracts* and PIRA improved the quality and variety of its services, there was no longer any point in attempting to compete with products which were much better than anything we could achieve with the resources at our disposal, so we abandoned abstracting altogether. However, because we are not entirely satisfied with the indexes and other searching aids available from outside sources, we have continued with the computer-assisted preparation of our own set of printed indexes to about 4,000 selected items per annum from the external literature.

This aims to make up for the deficiencies of external reference services in the following ways:

(a) It can be more up-to-date.
(b) It includes types of material, and caters for areas of interest, not adequately covered by other services.
(c) Its selectivity makes it more relevant to the needs of our users.
(d) Being tailored to our own needs, it provides a concentrated source of highly relevant material which would otherwise have to be found by searching in a multiplicity of other sources.
(e) We believe that the faceted form and generic grouping of the alphabetically arranged subject entries make it a more efficient tool to use than most other comparable types of index.

Its main advantages are that it provides a starting point in making searches and frequently leads us rapidly to the needed information without our having to look further. At a total cost of about £6,000 per annum, it is a fairly costly undertaking though nothing like so expensive as it would have been to continue our previous abstracting effort.

As our needs become progressively better met by new and improved external services we shall probably reduce our own indexing effort still further. However, there will always be material such as private reports, certain types of trade publication, regulations and codes of practice which, by its very nature, will have to be provided for by some form of internal retrieval system.

These changes in our methods of working have to some extent helped to offset increasing costs but, more important, they have enabled us to improve the quality of our service in other ways. In particular, it has allowed us to concentrate on giving a much more highly personal service to many of our users. We employ a team of information scientists each of whom is assigned principally to give a specialized service to several groups of users engaged in project, service or advisory work in particular broadly defined areas of technology. It is necessary, of course, to allow for some overlap in the subject specializations covered by these staff who keep each other informed of their users' requirements, transfer to other members of the team information pertinent to their interests and co-operate closely to ensure that their efforts are being deployed where they are most needed. Their activities include reviewing current sources of information, notifying their users of documents pertinent to their work, indexing selected items to facilitate later retrieval, answering enquiries and performing searches to meet specific needs and, where appropriate, compiling information reports and information surveys. To assist us in this work, 'individual interest profiles' are compiled and updated, describing the activities, problems and areas of technology with which the users are most concerned.

The information specialists also aim to keep closely in touch with the work of the people they serve and may attend progress meetings or regular briefing sessions on information requirements conducted by section or project managers.

In the paper cited earlier,[2] one of Tormey's conclusions is as follows:

> Management and technical information centres should foster the use of information specialists, which I define as an individual professionally trained in library science, but having extra specialization in information systems, computer storage and recall methods, and having a sound background in two or three fields of science or engineering. The principal role of the information specialist is to work directly with teams or functional groups of engineers and scientists in their work areas, anticipating or responding to their information needs, recommending or implementing on his own, the proper search, in the proper search mode through the proper depositories and delivering the relevant information from such searches to the requester in a form that the requester can use immediately.

This broadly describes the kind of approach we have been striving to achieve, but we have not quite aspired to this level of perfection. In fact, I must confess we have realized that, in the face of budgetary constraints and turnover of staff, it is not easy to maintain this kind of idealized service, even in an organization where there is a reasonable ratio of information scientists to staff served, in our case about 1 : 30.

So that we can continue to give a personal service to those who need it most, we are looking for ways of freeing the information staff from as much as possible of the work involved in routine chores. For this reason we have seized on any opportunities that have arisen to explore the potentialities of the newer external services.

It was felt that the needs of a small group of physical chemists working on corrosion problems might be met by the ASCA alerting service. The ISI representative, in collaboration with the chemists concerned, worked out a fairly specific profile consisting of about nine author terms in two modes and ten subject terms. The service continued for about eighteen months, during which period the profile was modified, first by reducing the number of subject terms to four in an attempt to eliminate a large percentage of totally irrelevant material, and later by adding new terms in order to extend the coverage into subject areas outside the corrosion field. Eventually, it was ceased because the chemists' subjective assessment was that it was not picking up much that they had not discovered earlier through their own reading or from other sources, including notifications from our information staff. Part of the cause for the apparently disappointing performance of this system may have been that the ASCA data-base consists principally of citations from, and to, a limited number of core journals out of the whole literature of science and technology. Because the chemists were still scanning most of the core journals in their field, and there are good reasons why they should continue to do this, it was likely that they had already found many items before they appeared in the ASCA lists. It also seemed that the information given in the ASCA output was frequently insufficient to assist in making accurate judgements of relevance. These impressions were largely borne out by a rather crude analysis made subsequently of the results obtained during one three month run when the profile remained unchanged. Of 376 items notified, 65 (or 17.3 per cent) were identified from the ASCA lists as perhaps having some relation to our interests, however remote. Of these 65 items, 38 (or 10.1 per cent) were possibly relevant and 27 (or 7.2 per cent) were probably pertinent. However, 28 of the hits (or 7.4 per cent of the total references received) were to documents which would almost certainly have been seen by the users. The remaining 37 (or 10 per cent) would have to be borrowed from outside, or assessed using abstracts, before we could tell whether or not they were really pertinent. It is interesting to note that most of the items judged as probably pertinent, 19 out of 27, were ones that the users had already seen, which suggests that without this hindsight, fewer items might have been recognized as pertinent from the details given in the notifications.

We then went to the other extreme and tried out an INSPEC group profile consisting of eighty-three subject terms grouped into twenty-five fields. This was intended principally to cover the interests of two physicists and four control engineers engaged in the design, development and application of electronic equipment. Here again, we found it difficult to establish the relevance or novelty of a paper on the basis of title and keywords alone, and this leads to even greater complications when assessing foreign language material. From records of the number of notifications for which the original item was requested, we estimate that the number of pertinent items retrieved, *appearing in sources we had not already seen,* amounted to between 2 and 3 per cent of the total notifications. During one nine month period, 860 cards were received, only 30 of which were even remotely of interest to the two physicists. During a comparable six month period, 88 relevant items were picked up from corresponding sections of *Science Abstracts*. This indicates that with two information scientists spending a little over one hour per month between them scanning appropriate sections of *Science Abstracts* they are likely to find between twice and four times as many significant references as would this particular INSPEC group profile at about twice the cost. The INSPEC cards are received about four months before the abstracts appear, but the advantage of advance notification is largely nullified if you have to wait to see the abstracts in order to assess the value of many items whose pertinence is not certain from the information given on the cards. It is true that these items can be borrowed or looked at in other libraries but this may involve a great deal of extra work, especially if translators have to be used to make summaries of material in foreign languages. It is worth remembering also that, when scanning abstracts, an information specialist can bear in mind the interests of a wide range of people. To cover the same range of interests using mechanized alerting services, would necessitate subscribing to a large number of individual profiles at a very substantial cost.

A principal reason for the failure of our group profile may have been that we tried to cover too wide a spectrum of interests with one blanket specification instead of paying the heavy extra cost for a considerable number of more precise individual profiles.

I would warn you not to read too much into these two examples. At the time when we began subscribing to these services, we had not discovered the best way to take advantage of what they had to offer, and neither our users nor our information staff had any experience of constructing profiles, so we had to rely largely on the system operators to do this for us. I believe that both ASCA and INSPEC can be extremely valuable services if used properly, for the right purposes. However, these examples do serve to illustrate how difficult it is to decide whether SDI services will meet particular needs. The main answer at present seems to be to pay for the necessary experience by investing in relatively low-cost, short-term trial runs before becoming committed to continuing services.

Since then we have had greater success with two trial current awareness searches carried out for us by UKCIS with a different purpose in view. Instead of being related to the broad interests of individuals, the aim was to retrieve references to current literature having some bearing on specific projects. An information specialist, who was thoroughly familiar with these projects, worked closely with the staff at Nottingham to devise suitable profiles. This enabled the information specialist to receive some instruction in profile writing which helped later when it came to profile modification. The first search, consisting of six computer runs at fortnightly intervals, yielded a total of 103 items, 14 of which were of direct interest and a further 14 of fringe interest. We considered this to be a fully satisfactory result and the relevant papers supported a decision on how the project should proceed.

Four runs have been made on the second search and we had to modify the original profile twice in order to adjust both precision and recall so as to reach what we regard as an optimum compromise. Very few items printed out have been instantly recognizable as fulfilling our needs but this is probably because little has been published on this topic. On average, about a dozen items from each run require checking in *Chemical Abstracts* before we can decide whether they will be useful. We think it may be helpful later to compare the performance of the different profiles by conducting several separate searches on the same fortnightly data-base. When the price of *Chemical Abstracts* was last raised, we were seriously thinking of cancelling our subscription. It is just as well we did not because we now know that we still need these abstracts to check on the output of some of the alerting services, as well as for carrying out certain retrospective searches that can still be performed manually.

Patents have for long been an important source of information to our company, and with the actual or impending changes to the patent laws in some countries, they are becoming more so. However, we could never hope to keep abreast of significant parts of the world's patent literature without the aid of the DERWENT services. We are now subscribing to a range of their products, notably those relating to the plastics, coatings and metals technologies. These are scanned by three specialist information scientists and, by making Xerox copies of interesting items, we are hoping to compile a weekly bulletin tailored to the needs of our company. As the retrospective file accumulates it may eventually be possible to use this for making searches much more rapidly than has hitherto been possible.

Some of the less sophisticated extensions to conventional services have proved particularly helpful. For example, we have found PIRA's *Packaging and Printing Abstracts* on separate cards, in weekly batches, most useful. These appear in advance of the printed bulletins and it takes only a few minutes to look through each batch. Pertinent cards can easily be picked out and sent to interested users who may return them to the library if they wish to see an original document.

I would have expected the ISIP topic profiles published by The Iron and Steel Institute to meet with the same ready acceptance because of their convenient and attractive format. However, few of our customers have persisted in using them, perhaps because they prefer to scan other more comprehensive sources.

There is little doubt that suitable mechanized aids to retrospective searching would save a great deal of the time of our information staff and enable us to give a more helpful service to our users. Unfortunately few such facilities are yet accessible to organizations who cannot afford to buy in data tapes and process these on their own computers. Our single experience of using the ESRO/ELDO terminal at St Mary Cray did not add much to what we had obtained from a manual search of the indexes to *Metal Abstracts*, mainly because little work had been done on the topic concerned. Nevertheless, it did confirm how much less tedious it can be to make a search in a well organized system of this kind than by consulting the indexes to printed abstracts. It also showed that lack of specificity in the indexing of material in the NASA and Government Reports Announcements files could make searching of these for some precisely defined topics an unendurably arduous process.

A mechanized search carried out on our behalf by another organization yielded nearly nine hundred references with titles and coded keyword combinations. Few users would have the patience to check up on the interest value of even the more promising looking items on a list as long as this. Not so long ago we made a search at the request of one of our users and duly delivered to him nearly fifty relevant patent specifications. Owing to other demands on his time, he had not finished examining these patents several months later. He obviously did not require the information very urgently but, had we known it was going to take him so long to digest these documents, we could have made the task much easier for him by, in the first instance, providing abstracts or extracts so organized as to help him to narrow down the amount he needed to assimilate.

How, then, are developments in external services affecting the work of information staff?

Well, it is clear that they have greatly reduced the amount of effort local information units have to put into creating their own data bases for current awareness and retrospective searching purposes.

In this way, they are giving the information staff more time to interact with their users, in order to obtain a clearer picture of their needs and enable them to make more effective use of the facilities now available.

On the other hand, the local information specialist must spend more of his time in determining which particular services can meet each of his specific needs and in learning how to devise effective profiles and search strategies compatible with the varying languages and logic of the different data bases. Aslib and the schools of librarianship and information science could do much to help by incorporating suitable practical instruction into their curricula. I doubt whether appropriate courses can be developed without the full co-operation of the organizations responsible for marketing the services, who must be prepared to supply full details of the scope, idiosyncrasies and potentialities of their systems. Frank and objective discussions between the users and producers of services, at conferences such as this, will lead to improvements in the exploitation of available tools that will benefit all concerned. The more feedback the systems specialists can get from the ultimate user, via the information specialist acting as an efficient intermediary, the more likely is it that their services will find successful applications.

One problem to which the system designers could give more attention is that we cannot always rely sufficiently on titles, as adequate identifiers of document content, even when supplemented by keywords taken from the abstracts. Providing lists of references, as the result of the mechanized matching of search questions with natural language terms in a document surrogate, may be the only way to keep down the price of many external services. But the savings to the user in purchase price might well be outweighed by the cost of his time in compiling search profiles and weeding out unwanted items from the search output.

The use of natural language for identifying document content, instead of a controlled terminology which can be used to give a systematic structure to the data-base, either in the store or at the time of searching, means that the user must apply considerable classificatory skill to the compilation of alerting or search profiles. An absorbing paper by Fugmann[6] explains why this should be so. Therefore, while there could come a time when less emphasis is placed on classification as an indexing tool, it is still one of the keystones of information work and should remain a core subject in the teaching of information practice. The ultimate information user cannot be expected to have this classificatory skill and so it is desirable for the information specialist to continue to involve himself in the users' information gathering activities.

Tracing a paper from the bibliographical reference may prove just as difficult and time consuming as retrieving the reference in the first place. Therefore, with the growth of these new services, disseminating increasing numbers of references, there will be a parallel need for librarians well versed in the most modern methods of bibliographical control, and fully conversant with a wide variety of documentary sources and the most efficient acquisition procedures.

REFERENCES

1 SLATER, M. *Technical Libraries: users and their demands.* London: Aslib, 1964.

2 TORMEY, J. F. Management looks at the information storehouse. Joint Engineering Management Conference of the Instrument Society of America, Pittsburgh, 1968. *Proceedings,* p. 52–8.

3 LYNCH, J. T. *and* SMITH, G. D. W. Scientific information by computer. *Nature,* 230, 5290, 19th March 1971, p. 153–6.

4 SMITH, G. *and* LYNCH, J. Information by the yard. *New Scientist and Science Journal,* 50, 745, 1st April 1971, p. 32–4.

5 GARFIELD, E. *and* SMITH, G. D. W. Information by the £. *New Scientist and Science Journal,* 51, 763, 5th August 1971, p. 341–3.

6 FUGMANN, R. The theoretical foundation of the IDC system: six postulates for information retrieval. *Aslib Proceedings,* 24, 2, February 1972, p. 123–38.

DISCUSSION

DR W. E. BATTEN (UKCIS) agreed with the speaker that titles are probably not adequate and that he would certainly like to see something better. It should be noted however that one of the main reasons for using titles in such services as *Chemical Titles* was that they enabled a data base to be prepared quickly, whereas the addition of abstracts invariably introduced delay. If the minimum requirement for checking relevance was a printed abstract then it might seem more logical to provide the user with nothing more than a reference number of some kind—from which he could refer to the abstract or original in the nearest major library—on the basis that what the user was paying for was selection, not massive chunks of print-out.

MR RIPPON replied that different organizations had different requirements and rapid alerting services can be regarded as a first line of defence.

MR B. STERN (Wellcome Foundation Ltd) agreed with Dr Batten that the user did not want a large amount of print-out and asked if the speaker would like to say what he understood by 'precision'.

MR RIPPON said that in addition to recall and relevance, which had their normal meaning, he used the word 'significance' in the sense that he considered a piece of information to be 'significant' when it was not only relevant and new, but actually led to some change in the user's behaviour.

MR T. M. AITCHISON (INSPEC) said that one of his colleagues would take up the question of the poor results from the INSPEC profile which Mr Rippon had mentioned. He wished to take up Mr Rippon's implication that all external machine-based services confine themselves to natural-language search. In fact, INSPEC shared his belief in the value of both classification and controlled-language indexing and as a result provided all three means of subject delineation, i.e. a broad classification, more specific controlled subject-headings and very specific free-index terms.

DR B. G. DUTTON (ICI Mond Division) described a small practical experiment in minimal signalling carried out in his own organization. There *Chemical Abstracts* was scanned manually to note those items which appeared to be relevant. Then the *Chemical Titles* tapes were processed to select the noted items and thus produce a bulletin, thus more or less guaranteeing to the user that the entries in that bulletin were relevant.

MR L. S. ADLER (Chemical Industries Association Ltd) said that in small and certainly in commercial information services, machine-readable services and sophisticated installations played no part. But the principles relating to urgency as against detail, i.e. titles and keywords versus abstract, abstract versus paper, nevertheless appeared.

There was need and room for all three stages:

(i) The rapid alert by titles and keywords—to the information officer—as a naming of abstracts which his new regular abstract service would be supplying in his field.

(ii) The abstracts themselves, selected as above—to be read by the information officer so that he/she could select those original papers important to his users' field.

(iii) The original papers, or those pieces of information or data, processed in such a manner by the Information Officer as to involve the user in minimum expenditure of time and effort.

MR RIPPON felt that there were circumstances in which advantage could be derived from putting some of the onus on scanning on the user, but agreed that the time they had available for this was short and so it was also necessary to present information in an organized manner. He emphasized that the art of presentation was one of the skills which the information staff must acquire if this was to be done properly.

MR A. E. CAWKELL (Institute for Scientific Information) pointed out that there were certain areas in which considerable benefit could be derived from using titles and he gave some examples.

MR F. LIEBESNY (Transociates Ltd) urged that at least the principles of economics be taught to students of librarianship and information science so that when they eventually managed large departments they would be able to apply those principles in their practical work.

MR RIPPON was prepared to agree that this was desirable provided that the teaching was in practical terms and not in the sense of an academic discipline. What was needed was instruction in practical measurement of the major parameters in library and information systems, so that there was a sound basis available for decision-making.

THE CHAIRMAN (Professor W. Saunders) said that one of the major problems in the library schools was the limitation imposed by shortage of time on any attempt to extend the curriculum to new areas of study. Better results might be obtained by encouraging students to be numerate and cost-conscious at all stages of the syllabus.

MR RIPPON said that a major difficulty was the effort required on the part of staff to collect and record the statistics upon which measurements are based. Attempts to set up even simple statistical recording often encountered resistance and the schools would be doing everyone a service if they were able to convince students of the necessity for this and teach them the best way of doing it.

MR P. CLAGUE (INSPEC) said that he welcomed Mr Rippon's call for frank and objective discussion between user and provider of information services. At the same time he suggested that it might have been possible to reply more helpfully to the performance figure quoted for a particular SDI profile if one had had prior notice and knew the basis on which the figure was compiled. INSPEC offered the user a range of options allowing him to take a greater or lesser responsibility for the compilation and monitoring of his profile. In this particular case the user opted not to send back relevance returns and all he could say was that the figure quoted was far lower than INSPEC would consider acceptable for those profiles which they compiled and monitored. Possibly the very breadth of the subject range which the Information Specialist at Metal Box had attempted to cover in this profile may have contributed to the low performance. Mr Rippon had, of course, pointed out that this particular profile was run at a time when they were untrained in profile construction and it may well be that it was the importance of training which he had intended to emphasize. However he was sure that Mr Rippon would not mind if he pointed out that Mr Rippon's quoted figures might reflect unfairly on the service.

MR RIPPON said that he had tried to point out that his comments on the INSPEC service were less in the nature of a criticism of the service itself than an expression of his own inexperience of the best way of using such a service. He felt that better results might have been obtained if his own staff had had a more extended training in the INSPEC system. Interactions of this kind between the user information staff and that of the service were clearly necessary but did make considerable demands on staff time; the profile may be only £50 a year but the cost of staff time may be much greater if an attempt were made to ensure that the service was properly used.

THE CHAIRMAN pointed out that there is clearly a need for training of prospective users of the more sophisticated services. He wondered if Aslib could provide suitable short courses for this purpose.

MR HALL (Sheffield University Library) spoke of the position in the universities where there was more scope for misuse, since in most cases users would be responsible for compiling their own profiles. He had the impression that this situation was encouraged by UKCIS who preferred direct contact rather than working through the library or other intermediary staff.

DR BATTEN assured Mr Hall that this was not true and that he had twice written personally to all librarians of academic institutions welcoming their co-operation in this respect.

BRIEF REVIEWS

ASSOCIATION OF BRITISH LIBRARY SCHOOLS. Directory of UK library school teachers. 3rd ed, rev. & ed. by John J. Eyre. London: Clive Bingley, 1972. 79 pp. £2.00. (0 85157 145 X)

Although this is the third edition of this directory, it is the first to be published in book form. It appears at a very opportune moment, when the lists of library school staffs have been dropped from the *Students' handbook* by the Library Association. It consists of three sections. First comes a section arranged by schools, listing the staff of each library school. This is followed by a section in which the individual teachers are arranged alphabetically. This gives details of their positions, the subjects they teach, their publications and their current research. The third section is an index of subjects taught, showing who teaches each subject and where. A particularly commendable feature is that the editor has compiled entries from other sources in cases where individual teachers failed to return his questionnaire. It seems a pity that, as with the *Students' handbook,* one school of information science, that of the City University, is not covered. It is to be hoped that the publishers will be able to keep this directory up-to-date with new editions at frequent intervals.

BOODSON, K. Non-ferrous metals: a bibliographical guide. London: Macdonald, 1972. 650 pp. £20.00. (ISBN 0356 04186 7)

As one of the *Macdonald Bibliographical Guides,* this publication lists with full bibliographical details over 4,300 references to books, reports, periodical articles etc., published mainly during the period 1956–1970. The arrangement and content of entries resembles those in earlier publications in this series: a general section listing reference books is followed by sections concerned with various common aspects of non-ferrous metals, for example structural metallurgy. The remaining forty-nine sections contain references to specific metals. The subject content of each reference and, where appropriate, the number of cited references and their dates are indicated. Author and subject indexes are included. This publication should prove useful to both librarians and scientists concerned with the tracing of literature in this field.

HERNER, SAUL *and* VELLUCCI, MATTHEW J., *eds.* Selected federal computer-based information systems. Washington D.C.: Information Resources Press, 1972. 215 pp. £14.75. (Available in the UK from Richard S. Gothard & Co. Ltd, Gothard House, Henley, Oxon, RG9 1AJ.) (ISBN 0 87815 007 2)

This is an enlarged and updated version of *Selected Mechanized Scientific and Technical Information Systems,* which appeared in 1968. The emphasis has been shifted, with the present volume reflecting the current preoccupation with computer-based services and including some systems which are not strictly scientific or technical: hence the change in title.

Thirty-five systems are treated here, each entry consisting of a verbal and a graphic description. The entries are organized alphabetically by system within an alphabetical framework of US Government Departments. Standard headings are used in each description, covering the various aspects of information systems and services usually described by such guides, for instance major components and services, scope, users/audience, equipment relationship to other systems, description and analysis. References to relevant literature are listed at the end of verbal entries. There are no indexes, but the contents and illustrations lists at the beginning are fairly detailed. The information provided was originally furnished and finally approved by the agencies concerned after a process of rewriting and editing. This process took approximately a year, and the final product was ready in July 1972.

Where this publication differs from other guides to information systems and services is in its detailed description and analysis of the systems covered and the fact that those systems are all 'federal'. Some of the systems included are: Cataloging and Indexing System (CAIN), National Technical Information Service (NTIS), Medical Literature Analysis and Retrieval System (MEDLARS), Highway Research Information Service (HRIS), Machine-Readable Cataloging (MARC), Science Information Exchange (SIE).

The extent to which the contents of the volume are directly relevant to users in this country is probably limited, but for anyone interested in learning about the different federal systems available and their particular features, and as a reference book in the field of information services, it should prove most valuable.

REVERSE ACRONYMS AND INITIALISMS DICTIONARY. Edited by Ellen T. Crowley and Robert C. Thomas. Detroit: Gale Research Co., 1972. 485 pp. $27.50.

This is intended as a companion volume to the Gale *Acronyms and Initialisms Dictionary*, 3rd edition, 1970, which is a straightforward alphabetical listing of mainly capital-lettered abbreviations and their meanings. Where this new publication puts an original slant on a reference book which is most useful and comprehensive in its field is in its arrangement alphabetically by the name of the organization or technical term which has been abbreviated (some 80,000 in all).

For instance 'STENCH' (Society to Exterminate Neo-Communist Harbingers) comes between 'SEG' (Society of Exploration Geophysicists) and 'SFL' (Society of Federal Linguists), and 'NAVALOT' (Allotment Division (Navy)) comes between 'ABC' (Allocations for Budgetary Control) and 'ASN' (Allotment Serial Number).

Because numerous abbreviated terms are formed in illogical ways this guide is necessary to anyone who wants to use the accepted acronyms in their work: in other words, for *producers* of literature. *Readers* should use the original *Acronyms and Initialisms Dictionary*, reviewed in *Aslib Proceedings* for September 1971.

British Librarianship and Information Science
1966–1970

EDITED BY H. A. WHATLEY

A review of progress in the late sixties

£8 (£6.40 *to L.A. Members*)

Still available

Five Years' Work in Librarianship 1961–5

EDITED BY PHILIP SEWELL

£5.75 (£4.60 *to L.A. Members*)

THE LIBRARY ASSOCIATION

FIRST for carpets
Dodson Bull

UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display
in our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 288 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 68402
BRISTOL: 2-3 Royal London House, Queen Charlotte St BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LG.
Tel: Southend 46569
9.00-5.30 Mon.-Fri. Sat. 9.00-12.00 (Manchester 9.00-4.00)

LIBRARY BINDING

This has been our trade since the last century, and in practising our craft we have given service to all types of libraries in many corners of the World.

We like to think we still bind books for libraries rather well, apart from our other activities as publishers and booksellers.

CEDRIC CHIVERS LTD
PORTWAY
BATH BA1 3NF

A Classified Directory of Japanese Periodicals

ENGINEERING AND INDUSTRIAL CHEMISTRY

Compiled by P. C. R. Mason

This guide to current Japanese periodical literature, in the fields of engineering and industrial chemistry, is based on the holdings of the National Reference Library of Science and Invention and the National Lending Library for Science and Technology, and upon the Japanese National Diet Library's *Directory of Japanese Periodicals.* The first part comprises a classified, annotated list giving such information as Japanese and English titles, language of articles, summaries and captions, date of first issues, and frequency. An alphabetical index of main and alternative titles follows.

The rapid increase in Japanese research and development over the last fifteen years has resulted in a corresponding increase in the publication of scientific and technical periodicals. By indicating what is available in particular subject areas, e.g. shipbuilding or plastics or pollution control, the directory aims to increase the general awareness of the existence and potential value of Japanese periodical literature, particularly where English language abstracting and indexing coverage is poor.

£3.50 (£3.00 to members)   160 pages; 1580 entries   SBN 85142 044 3

Aslib Publications

WHEN IT COMES TO PATIENT CARE, A "GOOD-ENOUGH" CURRENT AWARENESS SERVICE

ISN'T GOOD ENOUGH!

Practicing physicians need all the help they can get to keep up with new developments in their specialties. But, until now, it's been difficult to provide them with a current awareness service that's comprehensive and timely as well as inexpensive.

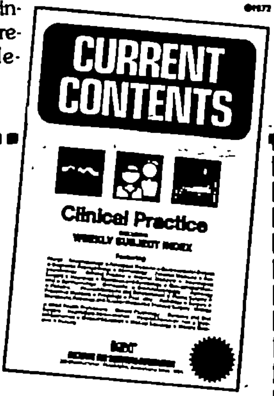
Starting January 3, 1973 there will be *Current Contents®/Clinical Practice* to solve the problem.

Each week, *CC®/Clinical Practice* will reproduce the tables of contents from more than 700 of the world's most important clinical journals (including all journals in the *Abridged Index Medicus*). That will give you the comprehensive coverage you need without increasing your journal budget or complicating your storage situation.

For timeliness, *CC/CP* will alert clinicians to new articles just days after they appear in the original journals. And because *CC/CP* will contain a *Weekly Subject Index*, they'll find articles on specific topics without scanning every contents page. The index even makes *CC/CP* good for very quick retrospective searches.

And don't worry about getting copies of articles from journals you don't have in your collection. Each issue of *CC/CP* will be backed-up by our *OATS®* service that provides almost-instant tearsheets of any article.

Every medical library will need several copies of *Current Contents/Clinical Practice*: one for the reference shelf and enough for direct routing to each of the key clinical services. Use the coupon to get a list of covered journals and information on reduced multiple-copy rates.



Please send me additional information on Current Contents®/Clinical Practice.

Name
Title
Organization
Street Address
City State
Zip Country

ISI® Institute for Scientific Information
325 Chestnut Street Philadelphia Pennsylvania 19106 U.S.A. Tel (215) 923 3300
13-343

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

CALCUTTA UNIVERSITY
CENTRAL LIBRARY

Aslib Proceeding

46th ASLIB ANNUAL CONFERENCE
Sheffield, September 1972

Conclusions and initiatives *W. Saunders, W. E. Batten, H. F. Dammers, C. G. Giles and B. T. Stern*

MANAGEMENT IN A SERVICE CONTEXT
One-day conference, Manchester, 21st November 1972

Management in a service environment *W. G. McClelland*

Programmed budgeting and cost effectiveness *D. Mason*

Staff management and staff participation *B. G. Dutton*

MARCH 1973
VOL. 25, NO. 3

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{matrix}\text{specific}\\ \text{recent}\end{matrix}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

- **Monthly Parts and Annual Volume**

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

Aslib Proceedings

VOLUME 25 MARCH 1973 NUMBER 3

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for Contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double-spaced, single-sided, on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

External Information Services

SESSION 6: CONCLUSIONS AND INITIATIVES

A discussion led by W. Saunders (Chairman), W. E. Batten, H. F. Dammers, C. G. Giles and B. T. Stern.

Proceedings of the final session of the 46th Aslib Annual Conference, University of Sheffield, 24th–27th September 1972

PROFESSOR W. SAUNDERS: I have listened with very great interest to the proceedings of the last two and a half days and it seems that a picture has gradually built up during that time. We started with Mr. Arnold and Mr. Vickery setting the scene and an attempt by Mr Vickery to indicate some broad guidelines, and then we had what really amounts to a very important series of case studies from various points of view. We finished with snags and problems and a look at the manpower implications. And at the end of it all, I must say that I have a general impression that the state of this particular art that we are concerned with is not unlike that of our own discipline of information science, information studies, or at least what it was a year or two ago. As a professional educationalist I am concerned all the time that I'm attempting to teach library and information science with theoretical frameworks, with general principles. I am trying to find a framework, I am trying to find principles. What one does so often find is empirical evidence, *ad hoc* studies, and gradually one is conscious that all of these studies are becoming accommodated, becoming built in to some sort of emerging theoretical framework, not very hard yet, but on its way. And so it is, it seems to me, with this present problem, the problem which is the theme of this conference, except that we are still very much at the stage of '*ad-hoc*-ery'.

This gathering marks a very useful step forward I think. We have had a lot of hard factual material to think about and now, at the end of this brief couple of days or so, it is our assignment this morning in this last session to attempt to pull some of it together. We have only one hour to do this in. We have had to prepare as we went along, we obviously were not too well aware of what was going to be said and what we had to try to pull together. We had a brief discussion yesterday. This made it clear that the four experts whom we have gathered here had each a particular area which he wanted to try to pull together this morning. So this is going to be the pattern of things, each of the four experts speaking, and then an attempt at a 'Where do we take it from here?' type of conclusion, hopefully with some sort of message for Aslib.

The panel comprises, as is obvious to you, four distinguished people from our field, people who are known to all of you certainly by their writings and now you have had the opportunity to meet them all at this gathering. Each, as I said, is going to speak briefly on his particular theme, then other panel members will have a chance to add a few words, and then we will open up that theme to the floor, but we have got to get through this pretty quickly and I shall have to be fairly brutal at times in moving on on the next session. Dr Batten, who is on my extreme left, is going to speak on the central problem of what is the proper use to make of the external mechanized services in the context of the total system. Mr Stern, who is next to me, is going to speak about costs, Mr Giles on measuring the effectiveness of the services, and Mr Dammers on what the lessons are which have come out of all of this, speaking as one who has himself dabbled quite extensively in it. So at this stage I have nothing more to do than to ask our first introducer, Dr Batten, to set us off with his particular theme—the central problem.

DR BATTEN: Thank you very much. Well, these four horsemen of the Apocalypse have four minutes each in which to pronounce doom, so I had better get moving because I have not got much longer than is allowed for a one and a half mile race; I hope I can at least get out of the stalls quickly. This is a very welcome change from what used to go on at these things fifteen years ago when we used to be divided into the 'righters' and the 'wrongers'. All has been, more or less, sweet reasonableness. I thought this conference seriously reflected a realization on everybody's part that you cannot classify any technique of information retrieval as right or wrong; you have got to look at everything and assess it, particularly as to its effect on your own situation; and I think this is going to occupy us for a number of decades yet, because the techniques and the services that we have to assess have not yet, like Hilaire Belloc's little girl, taken their final mould. They are all in the processes of change and so, my goodness, are the organizations that we serve, and we have got a fine job of balance to do in looking at all these things. Economics and cost effectiveness have been mentioned. Whether you take a professional view of them or not, I think what it really boils down to in very brief is that to our arts of literacy we are now called upon to add the arts of numeracy which have probably rarely had anything much to do with librarianship in the past.

I would just like to say a little bit about the possible shape of the computerized side of the services. We have noted two good areas of debate which are not resolved at all yet, I think. One is to what extent can a computerized service ever hope to approximate to a true personal need. For myself, I doubt if it will ever give you what our old friend, Bob Fairthorne, used to call 'all and only'—it will always give you a compromise; therefore I think it is still very much a debatable question whether those services are not some kind of an intermediary wholesaling step between the purveyors of literature in the mass on the one hand and the poor chap who only wants to read about five papers every month on the other. It may well be, and I think it almost inevitable, that a further screening process is going to be *de rigueur* to follow up the results of any computerized search. Also, of course, along that line there is the question still to be resolved of what is the right and what is the most economic form of output to give. We have already raised the question whether redundant printing is worth anybody's while to pay for. It depends whether you are, I suppose, luxury-minded or not, and one might compare it with frozen food and real food. I struck an attitude about frozen food myself once upon a time, tried to stick by it, but of course the quality of ordinary food declined at such a rapid rate that eventually I couldn't distinguish the two, and so, like everybody else, I fell in with the frozen food and the nylon shirts and all the other infamous things that we have to live with now.

And how are we going to be aided in finding our way about this morass of variety which has come in the wake of the so-called explosion? Perhaps this is a bit simple but I think that through the good offices of Aslib, and with the co-operation of all who can possibly contribute, something in the nature of a gigantic systems diagram has got to be created for all the alternatives and all the decision points available to the information officer in tackling his job, so that you do have a total map to which you can append a comment and cost data and performance data as and when it arises. You could always see the whole thing in perspective and, of course, this map would gradually become simplified as certain of the footpaths fell into disuse because nobody wanted to walk that way. Eventually the high roads through this great morass would be determined. This, I am sure, is a practical endeavour in which Aslib could play a leading part. Just, I think, a word of inspiration to encourage us along the way. Tradition has been that information services were a kind of a prop or support to the laboratories. I suggest to you that in the twenty-first century the laboratory may become the support or prop to the information service and when you can no longer find the boiling point of water in the literature you send a man into the laboratory to measure it. Thank you very much.

DR SIMKINS (Smith, Kline and French): Could I get in a quick one, not on the total issue, but Dr Batten again came back to Mr Stern's earlier point of redundant printing of abstracts which, as far as I am concerned, is a misinterpretation. What I am asking for, and I think other people are, too, is that the hard copy abstract should be on my desk at the same time as the computer output from which I have to select. I do not in the least care whether the computer prints it or somebody else prints it; the point is that there should be an abstract there to look at.

DR BATTEN: And there should be money there to pay for it.

DR SIMKINS: Certainly.

MR STERN: Or, alternatively, you might even consider looking at the journal that carries the text.

DR SIMKINS: I can give you at least one example where—I think this was the *Journal of Antibiotics* of Tokyo, which is in English—having found an interesting abstract and thought I must go further, I went up to the National Reference Library and I got the abstract before the journal had arrived in this country.

PROF. SAUNDERS: Well, as there is no comment on that particular issue I think it is a nice lead in to Mr Stern's theme, which is the problem of costs.

MR STERN: Thank you. I feel rather at a disadvantage here becauseI have no service to plug! Seriously though, I think one of the points that lead in from Bill Batten's idea of a overall flow drawing or diagram is the need for quantification. It is no use using words in a rather glib manner—I have already made reference, for instance, to the lack of definition when people are using the term 'precision'. It means different things, I suspect, to different people and therefore we must find a way to pin down precisely what we mean; a methodology of the way in which we examine not only data bases and the service that they give, but the other techniques that we use ourselves in-house. It might even be possible for some of us to consider using that branch of mathematics known as statistical analysis where you are going to get an indication objectively of how valid the conclusions are that you draw from a particular set of results or observations.

To costs—there are clearly the direct costs, but also the indirect costs which so often are forgotten. I have split these rather crudely into two main headings—there may well be others. The first one that has arisen in my mind during this conference is the hidden cost of the work the user has to carry out in interpreting the results notified by an alert from a particular service. This 'user interpretation' can be a considerable cost when taken throughout an organization that is receiving many alerting references from a data base. Secondly, there are overheads. Now this is a beauty. With overheads you must often accept the items which the finance controllers in your organization charge to your service. Let me explain what I mean by this. In the Wellcome Research Laboratories at Beckenham one of the information centres there has until recently been charged for three sheep. Now the sheep do not live in the information centre and, indeed, we have no real need to have access to sheep in the work that we do. This could be a value judgement by management on the work we do; I am not sure! Certainly we are charged for space, the space that we occupy. Certainly we have to make an allowance for not just the working hours that are normally available and then deduct the holidays, but we must also deduct a factor, for example, for the average time a person is away sick each year, or a training allowance, or attendance at Aslib conferences, and these are all hidden costs. The salary loading is also a necessary factor. You can take an average salary but it costs the employer rather more than he directly pays to you in terms of insurance and in terms of social security, and so forth.

The reason for this concentration on costs is that the management are undertaking a value judgement in the only terms that they can understand and that is the effectiveness of your service in terms of what it costs. They are, at best, informed users and in the absence of detailed information they will give a very cursory glance at the budget proposals that you give to them and make this instinctive value judgement in the absence of any more direct quantified results. What I am saying is that there is a need for professionalism. What I am saying is that the Aslib organization must receive your ideas and act upon them. For example, there are discussions under way at the moment to arrange a workshop on costing methods.

I also suggest that you have the boss that you deserve, in that unless you carry out a dialogue with your management as to the way in which you can deliver your service and almost guarantee certain results for a given expenditure you are going to be in a difficult situation in attempting to increase the level of your contribution to the company's objectives. One small point—we do not serve an individual user. We are a service operation, yes, but it is a service to the company's objectives or the organization's objectives and on those occasions when the individual user comes and makes a demand which you feel is unreasonable you should have the confidence of being able to say 'No, I cannot do this because it is not in the company's objectives'. You are not serving an individual in quite that way. I am suggesting perhaps that in the business of concept communication, which is perhaps one way of looking at our activity in business, that we are generally very bad at communicating. The communication that you have with Aslib in the demands you make as members, for example, could well be more vociferous. The way in which you speak to users and tell them of your services within your own organization could also be better. How many of you provide a guide for users and make sure that it's kept up to date?

PROF. SAUNDERS: Thank you very much, Mr Stern. Now, I wonder if any members of the panel have additions to make to what Mr Stern has said? Well, can I invite comment and amplification from the floor please?

MR HOEY (J. Lyons & Co. Ltd.): This subject of telling a client that you are not going to answer his questions because you, the information scientist, manager, or whatever, do not consider it relevant to group needs, is a very interesting one, particularly if one is based in, for example, group research and development, as I am, and am seen by the accountants, if you like, to be funded by group R & D, and yet my responsibilities go over the whole group and not just in the realms of R & D, but in manufacturing, engineering and the like, and techno-commercial areas such as whatever you want to call those. You work very hard to provide a group-wide service, not just in the realms of R & D and technical information in the sort of pure sense of technical information, but in the sense of engineering, production, operations, research maybe, whatever is called for at any particular time. You then establish your own priorities in your own mind and at some point you may find that you cannot do what the R & D manager, the pure R & D manager, wants you to do because it does not fit with your concept of the total group's or company's objectives; so you refuse him. A new day of reckoning arrives and your budget is up for review, and what happens? If you are unlucky the person who is approving the budget or who has a large say in approving the budget is the man who you have refused to do a service for a few months beforehand. How does Mr Stern cope with this kind of situation?

MR STERN: Fortunately, Peter, I have not faced this one yet. Thank you for the forewarning. Obviously, when you are saying to someone 'No, I cannot do this' you do not just leave it at that. You clearly have to explain why you do not think so and a dialogue follows. Now, indeed it is this dialogue which is your greatest defence to the user in drawing him into the problems that you have to face and if, indeed, he is the group R & D manager who is receiving your refusal he is going to be all the more impressed with, as Jack Rippon put it in his earlier paper, juggling the various parts of his equation. So not just a blunt refusal, but effectively a refusal followed by a dialogue and possibly a reformulation of the original request.

DR CAMPBELL (without regrets, no organization at all): May I make a point that I thought of making this morning, but then did not seem to fit into the discussion. Various remarks have been made during this conference about assessing the worth of information in monetary terms. I do not believe this is possible; I have very strict doubts as to whether it ever will be possible. What we must get over to management is the negation of the idea, that management has also often been trained, in that nothing that you cannot put a price tag on is of any importance. This, I think, is a thoroughly vicious piece of management training. As Farradane has put it on many occasions, a good information service is an insurance against being caught bending by your competitors. You can have 'with-profit policies' or 'without-profit policies' but nobody really expects dividends on insurance premiums. The same argument applies to a great deal of research. When a company undertakes a piece of research it is in the hope that it will improve the cost effectiveness of the company. There is no guarantee. An information service, I think we should all stress, is in the same context. This does not mean that we must not tell the people of our successes—by all means let us tell them our successes—but let us get away from this idea, I submit, that you can put a price tag on information.

PROF. SAUNDERS: Thank you very much, Dr Campbell. Mr Stern would like to come back on this point.

B. STERN: Let us be clear what we are talking about. I am sorry, John, I do not altogether feel that you have defined your terms. I am not talking about cost benefit, I am not talking about the profit that you have as a result of having a piece of information. What I am talking about is finding out what it costs to do the job you are already doing, to do the job in the most effective and therefore the most economic manner, so many of us do not know what our individual jobs are costing on a day-to-day basis.

PROF. SAUNDERS: Now, I think Mr Vickery had a point to make and that must be the last point for this particular section at this stage.

B. C. VICKERY (Aslib): It was a very brief point. We only have an hour to talk about the problem of external services as distinct from our own internal services and we seem to be wandering off on to the point of how to sell ourselves to management. Could speakers please try and concentrate on the main theme. It seemed to me a little bit that some of the things that Barrie said were not sharply directed towards this theme. For example, he mentioned the user costs, the cost of the user studying information that is provided. Well, this is a cost whether it is external or internal, not necessarily different in the one case than the other. I think we must concentrate on the main theme of today.

PROF. SAUNDERS: Now I think we will move on to Mr Giles' theme, which is measuring the effectiveness of services.

MR GILES: Mr Vickery's last remark gives me a problem. It was decided that I should say a few things about evaluating services, but my remarks will not be necessarily confined to external services. I do have services to plug, yes, but I was not going to plug them at this moment. One of the things I regard as important as a provider of services is the question of a dialogue with users. Something that keeps coming up in the international bodies talking about information for industry is the growing importance of establishing a dialogue between government, the users of information and the information industry, in order to arrive at services which really are tailored to users' needs. My main objective then is to make sure that what we are doing is the thing that people need, and so I have been very interested to listen to what people have been saying about these requirements at this conference and I personally would welcome any mechanism that could enable this interaction to continue.

Before I came into the information field I was concerned with evaluating safety propaganda. That is a curious kind of service too which is particularly difficult to evaluate—probably just as difficult as information. Nevertheless, a good deal of money is spent on it so one has got to try and make some sort of evaluation. Since I started in information I have therefore attempted to evaluate all the services we run, to find out for example what it cost to put an item on the library shelves, who was in fact using the library, how often and so on. This has been extremely valuable. To do this on a particular day we simply took stock of who telephoned or came to use the library. We used a very simple little check list which was beside the desk of the people on the counter and beside the telephone for the people receiving telephone enquiries. We found for example that our library had one enquiry every three minutes in the course of a typical day. Up to one in four people in the building where the library was situated used the library in the course of one day.

When we come to evaluating the services we give outside, the main technique is by surveys. Now, there are one or two things about surveys that I have learnt that I thought it might be useful to pass on. First of all, it is no good assuming that you know all the relevant things that are in the minds of the people who are going to receive your questionnaire. So, generally speaking, we start by having a group discussion. We get eight or ten people from the largest area to sit down and talk about the subject in a very pleasant, relaxed environment. The leader of the discussion does not say very much, he steers the discussion round to the area of interest, letting people talk together for about an hour. We then find out what points come up, and this is a valuable clue to the kind of things that ought to be in the questionnaire. Ideas from eight people whom you have selected to represent your population in this way are much better than trying to think of them from your own head. You know what your problems are and you do not know what theirs are. Of course one can repeat the process with other groups until one reaches a point where really new ideas no longer emerge from the discussions. Having done that, one formulates a questionnaire. Now, I am thoroughly opposed to long questionnaires. In my view a questionnaire has got to be so easy to complete that the man who gets it starts filling it in right away, without any hesitation. If you have got any question that is going to make him 'gulp' or 'think hard' put it right at the end, so he says 'Oh, well, I've nearly finished and I could just do this one then.' Secondly, do not put your individual questions when you are seeking value judgements in terms of ascending or descending order of goodness. People like to please and do what is expected of them and you can very easily steer people to the kind of opinions you want. What you really want is their opinions and not a reflection of your opinions.

Now, having got a questionnaire ready, the next thing to do is to pilot it. That is to say go out to a small number of people typical of those who are going to get the questionnaire and put it to them and see that they really understand what you mean by the questions and make sure they have no problems in answering them. You will find that if you have got a dozen questions, two or three of them may well be misinterpreted by the people for whom they are intended. Next, avoid open-ended questions that say 'What is your opinion of X?', for example. If you do this you will probably get so many different opinions that you will not be able to score them or quantify the replies when you get them. Rather give people various choices which they have simply to tick. If you feel it is necessary, put 'other' at the end and give them a chance to express their opinion but do not steer them too much.

Now, on the question of evaluating benefits, the sort of thing one can always find out how is much time people think you are saving them by providing the service. We have produced an abstract service internally for some time and it was very easy to establish on this basis when it was under review, that it was saving far more than its cost. Recently, in another context, we surveyed the information needs of engineering designers throughout industry and we found that in the sectors we covered engineering designers were spending a large part of their time merely in looking for information—not in using it, nor in interpreting it. Moreover the information they were looking for more often than not, and I am very glad Mr Rippon mentioned it this morning, is product data, information about components and things of that kind. Not esoteric things in the field of science and technology but 'What is this electric motor like?', 'Where are the bolt holes?', 'Will it fit into this design?' and things of that kind. I think it is very important if one is in the industrial field to realise the economic importance of product data. When we were given a list of things that information services might be doing including things like social sciences, I felt the urge to mention the great importance of product data. I was very glad this came up later. Well, I am glad to have had a chance to be here, glad to talk. I hope that whatever happens as a result of this conference some machinery may be set up somewhere which can lead to a continuous interaction between users of services and providers of services, possibly including the information industry. I fear, however, I have had more than my measure of time in saying all this and I apologize for over-running.

PROF. SAUNDERS: No, I think you have done very well on time Mr Giles. I do not think Mr Giles need have been so apologetic at the beginning about introducing this particular theme. Obviously, if we are to have a valid and reasonably scientific approach to this whole problem, which is what we are hoping to move towards in the fullness of time, this sort of groundwork has got to be approached in the appropriately scientific and valid way, and I think all of us have been struck by the frankness of some of the speakers about the snags that they have found and the holes that they have found in some of their questionnaires, their interviewing schedules and so forth afterwards, when it was too late. I think this is a very important message to have got through and I think it is worth giving a minute or two of further discussion and consideration of this if any members present have any contributions to make.

MRS VICKERY (Imperial College): I would like to know what is the policy of the Department of Trade and Industry in supporting small external services.

MR GILES: Essentially the answer is that if a service can justify support, we are happy to assist. DTI gives support via a contract mechanism and we would expect candidates for our support to operate to the same kind of strict guidelines as we apply to our own services. Thus, we expect the services we launch to operate to fairly close cost and revenue targets and with the aim of reaching some-specified target for financial return within three years. Normally, if we do not succeed in reaching the target, the service is discontinued. This is clearly one reason why I am keen to sell the various services we operate. Thus, if anyone comes to us and says 'Here is a service which we would like you to help in launching', we expect them to be able to produce the same kind of precise ideas of what the service aims to accomplish and in what time, as we have to put forward ourselves. As far as we are concerned, this aspect is a key factor in helping to decide whether or not support can be given.

PROF. SAUNDERS: I think at this stage we move on to the final contribution from the panel, from Mr Dammers, who seems to have a pretty all-embracing remit—What are the lessons?

MR DAMMERS: I have taken my brief to be a looking-back at some of our experiences at Sittingbourne, rather than making an attempt to summarize the proceedings of the conference.

The justification for my approach is the fact that we have been involved, for around a decade now, in the development of information systems, notably those which are computer oriented and we have relied in this, quite heavily, on the use of externally supplied data-bases. The systems we are running are sizeable, I think, by any standards and it may be worthwhile to reflect on the experience gained with them over several years of operation.

Basically I should like to indicate, in the short time available, the motivation behind our development and some of the lessons I think we have learnt in the process.

In the first place, then, the motivation. This arises perhaps mainly from the dilemma with which most information departments tend to be faced, in particular at the present time. They have to control and even reduce cost, yet they are also expected to maintain and perhaps expand services. They are required to provide more user-oriented services, a wider range of capabilities whilst at the same time coping with an expanding volume of literature, increasing unit cost of the literature, a wider diversity of external services and last but not least escalating labour costs.

We faced this dilemma albeit perhaps not so acutely around the mid-sixties and decided to resolve it by moving, with some determination, towards computer-based systems as the most cost-effective approach. At the time this was considered, perhaps by most, to be a gamble but I believe we can say that it has paid off, in fact we have been rather successful. For instance our SDI services, based on tapes from the Chemical Abstracts and Biological Abstracts Services, are extensively used by our research staff and enable us to meet current awareness requirements in a highly personalized and very cost-effective manner.

The lessons I would be inclined to draw from this are firstly that one should not necessarily take the common view of experts for granted. At the time most would probably have considered our approach economically unpromising, yet the economic aspect was one of the main reasons for adopting our chosen route. This leads to the second observation: one should look very hard and in considerable detail at one's real costs, at the longer term trend in one's costs and at the cost of alternatives; with regard to the alternatives in particular one should look at longer term expectations, e.g. those arising from likely improvements in technology. Cost justification is crucial, without it, certainly in our environment, it is no-go.

The next point to make is that a re-orientation, as was involved in our switch towards a more computer-orientated approach, needs a very pragmatic and adaptive approach. One really needs to consider carefully how one can progress step-wise, maintaining an adequate capability to cope with each step and its side-effects.

Any grand system ("great leap forward") approach is usually very costly not only as regards development but also in its eventual implementation. Hence, if at all possible, one should avoid it like the plague; we certainly have. Grand systems have a very nasty habit of never working out quite as intended.

A vital factor is the quality of one's staff; one needs staff with a wide range of capabilities and aptitudes but I should immediately add that more often than not aptitude and capabilities tend to develop to meet the challenges presented; they grow in response to the highly pragmatic approach one adopts in tackling the variety of problems one is confronted with. Versatility in people is often much greater than is generally assumed.

Previous speakers have already mentioned the importance of being aware of users' needs and management critique. One really has to have one's ear to the ground and have a feel for the way things are moving, attitudes are changing. This makes it possible not only to ensure adaption to changing needs and expectations but also to sell to users and management whatever one is capable of providing. Marketing the capabilities of the available facilities, exploiting them to the fullest extent, is very important indeed.

Last, but not least, one has to be very aware of what goes on in the field of one's expertise (say information technology) in general, and the possible implications with respect to one's own activities. There is nobody who can tell you really what to apply in your own circumstances; you can only do that yourself.

Because the choices are so much wider and the decision situations often so much more complex, human versatility and ingenuity are probably more valuable now than ever before. The facilities presented to us these days are tending to put more emphasis on human capabilities rather than less. It is, I think, one of the more encouraging aspects of current developments.

PROF. SAUNDERS: Thank you very much. Now, at this stage, would anyone like to add further to what Mr Dammers has said?

MR BEER (BP Chemicals): Much of what has been said at this conference is easier to apply in a large Information Department than in a small Information Unit, even if—like mine—it belongs to a large industrial organization. Mr Stern's advice to cost the activities of the department would be difficult to carry out, because we could not spare the time and because the hours of the working day have to be devoted to a diversity of activities.

We serve a Research and Development Department as well as the managerial, administrative, and technical staff of a chemical works in Scotland—about 250 people. Our work of collecting, storing, and disseminating information and of running the library is liable to be interrupted at any moment by callers in person, over the telephone, or by written messages.

If we want to have some measure of proving how we are spending our time and what use is made of our resources, Mr Giles advice is more useful, viz., keep a simple record of who uses the library/information service; how many people use it per day; how many internal and external loans are dealt with per month; how many enquiries are answered successfully; how many requests are made for items in the library bulletin.

Speakers at this conference have been based mainly on a R & D Department and concerned themselves with its information problems. Only Mr Rippon touched on the needs of the 'practical' man. I would confirm what Mr Giles said about the kind of information which is needed by engineers of all kinds, viz., facts and data about engineering materials and their suppliers, physical and chemical properties of materials, their hazards, the Government regulations and standard specifications related to them. From my experience in serving a R & D Department as well as a factory staff I know—and many of you know—that engineers have neither the time nor the inclination to receive a current awareness service. What they want to be certain of is that their library/information service are aware of what is currently published in the periodicals and trade literature, and are versatile enough to appreciate what is of value now and may be of value later on, but most of all, able to retrieve what they need at any moment with as little delay as possible.

I wish that this conference had paid a little more attention to the ways in which the work of a small unit could be made easier by the use of external information services.

PROF. SAUNDERS: Thank you very much. Well, we are at the stage now, ladies and gentlemen, where we should move on to look towards any conclusions that may come out of what has gone on during the last two and a half days. It is very difficult indeed to pinpoint specific issues, specific problems, to single them out from others, but one practical point which has cropped up on more than one occasion is this problem which so many people are facing in the writing of profiles and one wonders if it is feasible to provide some sort of service to assist with the writing of profiles. Is this something which can be engineered through Aslib, perhaps? How would the conference feel about the feasibility of a exercise of this sort, starting hopefully with some attention to the principles of profile writing.

MR ROBINSON (ICI): I would like to address myself to a little wider issue than that. I believe that one of the problems that will face people who have sat through this two and a half day marathon is that they have heard a lot of things and have not necessarily had time to assess the relevance of each one of them to their own particular situation, and I believe that the question of education in costs, in profiling, the question of relating what the various suppliers do to what each organization wants are things which one should go away and deliberate, and I feel that I would like to suggest that we do take some quite firm initiatives for people at this conference to take one step further when they get back to their own units, large or small. I would like to suggest that under the aegis of Aslib a questionnaire is produced and sent to the members here represented to ask them if, having heard all this blurb about how things can be used and the problems that people face in using them, they now feel (a) 'no more, thank you', (b) 'yes, we are interested', etc., etc.; in other words, design a questionnaire whereby people can state, having heard of us and having had time to consider it, what steps they would think they would like to make themselves in the future;

PROF. SAUNDERS: Feedback from users. Thank you very much.

MR ROBINSON (ICI): I would like to go on a little further because I think we ought to direct ourselves from there on to a series of workshops where we could, in fact, tackle—I was going to say 'conclusively', that is a beautiful word that never means anything—'fairly hard' the question of user education for small systems (and I put that down first, Mr. Beer, before I heard your comment), major systems, user education partly in profiles, partly in just how you get hold of the service, and finally one in supplier/user groups, and I think that an initiative of this type from this conference would be very useful indeed.

PROF. SAUNDERS: Thank you very much indeed. I am sure due note has been taken.

MISS CARGILL-THOMPSON (Strathclyde University): I was one of the lucky people to go to one of Dr Leggate's courses at Oxford, which was OSTI supported, on profile construction. I have also been to the Aslib course for librarians to teach them how to teach, and I would suggest that Aslib might very well take up Dr Leggate's course and put it into a more formal one week short course. This would cover the profile construction.

PROF. SAUNDERS: Thank you very much.

JOHN SIMPSON (Open University): I am glad that some constructive suggestions have been made for carrying further the discussions that have taken place at this conference and one way that I would also like them to be taken further is to consider implications in other fields than those that have been discussed. This has been rather a cosy conference. It is the usual Aslib scene of science, technology and commerce, and information in firms. Now some of us are not in this particular morass alone, as Mr Stern referred to it. We are in a jungle that goes further, that goes into the social sciences and the arts and that has to deal with media that are not good old-fashioned print. Now, this is not merely a morass. It is a jungle with frequent earthquakes and the problems that we have in using things like ERIC tapes are rather more difficult than those that have been discussed at this weekend. I do hope that Aslib will move in that direction as well as along the well-worn paths which, admittedly, need to be continued to be walked on, but we have other places to go as well.

PROF. SAUNDERS: Thank you very much. Mr Cawkell has been very patient but this really must be the last one.

MR CAWKELL (ISI): I believe I can speak on behalf of all suppliers of external services, certainly on behalf of I.S.I., when I say that I have listened most carefully to the speakers and discussions at this conference. I am already thinking about several things we might do to improve services. Indeed, if we do not listen and do not respond to users needs, we are likely to go out of business.

The words 'something to plug' have, perhaps, acquired a derogatory meaning at this conference. I am proud to be associated with a 'for-profit' organization which has something to plug, because I find myself in excellent company. After all, Shannon, Luhn, Taube, and Garfield, all did or are working for 'for-profit' organizations with something to plug, and have appreciably advanced the state of the art in information science.

PROF. SAUNDERS: Thank you very much indeed. Well, clearly, as I said at the beginning, there has been a great ferment of activity in this whole area and it has been a privilege, albeit a somewhat exhausting one, to hear from some of the people who have been in the thick of it. We are at the stage, I think, quite clearly where quite a lot of this can be pulled together. I think the proceedings of this conference, for example, will make very useful and fruitful reading in the quiet of an armchair rather than in the hurly-burly of discussion of this sort. Aslib clearly has already done a great deal towards helping to chart this jungle which was just referred to, the booklet which Mr Vickery waved at us on the first day is a very important step forward. Dr Batten has produced a request for a gigantic systems diagram of all alternatives. Well, this obviously is a glittering prospect. I think Dr Batten knows better than most, perhaps, what that implies in terms of the research and activity that will be needed for which this sort of chart is likely to be an end product. Nevertheless, I think it is something which we can reasonably throw in the direction of Aslib's Research Department, to put on their no doubt lengthy agenda, 'projects awaiting consideration'. If I know Brian Vickery I shall not be surprised if perhaps he has been thinking in this direction already. Clearly, I think there is an educational message from all that has been said during the last day and a half. I think educators in general, professional educators, have got to take account and take cognizance of the many observations that have been made with implications for those concerned with professional education for library and information science. Clearly, too, Aslib, with this extraordinarily important role of presenting short courses of all types, must and no doubt is taking cognizance of what has cropped up. Clearly, there is immense scope for Aslib's short course department for doing quite a lot to plug some of the gaps that have been revealed during these last few days. And finally I would like to welcome very much the suggestion that was made for a series of workshops. Clearly, this needs very serious consideration. I suppose during these last few days we have in the information industry been exploring what so many other industries have to face from time to time, the implications of technological change, because this is what it really boils down to. I think what we have heard is encouraging; there is a lot of activity under way. As I said at the beginning, what we must try to move towards is a situation in which all of this has been pulled together in some sort of coherent and manageable framework. On that, I hope, encouraging note I would like to conclude, thanking very heartily indeed the four panel specialists. Thank you all very much.

Management in a service environment

W. G. McClelland

Director, Manchester Business School

Paper presented at a one-day Conference on 'Management in a service context', Manchester, 21st November 1972

The systematic study of management has seen rapid development in this century since the early years when F. W. Taylor was studying the design of work and Henri Fayol the design of organizations. The inter-war period for example saw the Hawthorne experiments and the growth of the so-called human relations school and the second world war the initiation of Operational Research. In the last twenty or thirty years all the social sciences have been developing rapidly and so has their application to the problems of management.

So far as management is concerned much of this progress is owed to the leading American business schools, which, however, are only now abandoning their former exclusive preoccupation with the commercial sector. By contrast the study of public administration, particularly in this country, has not developed equally systematically and it must be said that the study of organizations is handicapped if they are of a sort in respect of whose output or service the exchange of money does not provide a ready measure of its value.

This handicap does not arise in connection with the behaviour of human beings in such organizations. This sector experiences, therefore, similar advantages (and difficulties) in, for example, applying what psychology can teach about selection, motivation, work design, human capacity and needs, and so on; in applying what social psychology and sociology can teach about behaviour in groups and the effects of roles; in applying what Organization Theory can teach about organizational adaptation to change, the effects of the work technology, and the characteristics of organizational differentiation and integration.

The handicap arises because of the additional difficulty in making rational decisions as to the allocation of resources in the absence of objective value measurements, depending in the last resort on large numbers of individual preferences. The application of many management techniques depends on it being possible to make appropriate measurements reasonably economically. Nevertheless, even if such measurements are not available, economic reasoning and concepts can be a help. Such concepts include for example:

(1) The time value of money, related to interest and discount rates in the community at large, and its implications for the comparison of costs and benefits arising at different times.

(2) The handling of uncertainty through probability theory and the concept of expected value.

(3) The analysis of costs, for example the concept of short term and long term relevant or avoidable costs and the concept of opportunity cost.

As an example of such concepts in a library context, let us take the acquisition decision. This is essentially a decision to incur expenditure now through buying and accessing a volume in the expectation of benefits in the future through the subsequent use of that volume. It is therefore exactly on all fours with the capital expenditure decisions of the business man and is susceptible to the same form of analysis. Table 1 takes the case of a volume costing £6 on accession, bought half way through year 0, used in years 1 to 5 and of no further value in and from year 6. It assumes that the number of uses rises to a peak in year 2, then declines rapidly, and I suppose this would be a not infrequent pattern. It assumes that there is some way of estimating the net value of each use, and I shall return to this point. It assumes also a relatively high value for the single use in year 5.

TABLE 1: *Cost of purchase and accession*: £6

Year	*Number of Uses*	*Average value of use* £.p	*Total value in year* £.p	*Discount factor at* 10%	*Present value* £.p
1	5	.50	2.50	.900	2.250
2	8	.30	2.40	.810	1.944
3	3	.40	1.20	.729	0.875
				SUB-TOTAL	5.0691
4	0	—	—	.656	
5	1	3.00	3.00	.590	1.771
				TOTAL	6.840

To compare with the accession cost in year 0, the total value arising in each subsequent year must be discounted because any of us would prefer £100 now to £100 later if for no other reason than that we could invest it and earn interest on it in the meantime. I have assumed that the appropriate rate of discount would be 10 per cent per annum. Applying the corresponding discount factors gives us a total present value of the use of this volume of £6.84, which is over the cost of acquisition. All of the first three years of use however—when discounted—only add up to £5.062 so that the purchase would not have been worth making had it not been for the single use in year 5.

This calculation is of course unrealistic in a number of ways. First, either it is made at the end of the five years, in which case it is no use in respect of actually taking the decision; or it must be based on estimates, and they can hardly be expected to be very accurate. Well, decisions on acquisitions do get made implicitly on the basis of some estimate of the value of the acquisition to the library service and if acquired the volume would turn out to have such value—possibly the same as, possibly near to and possibly far from (either above or below), the estimate made. Let us plot estimates against reality, ex-ante against

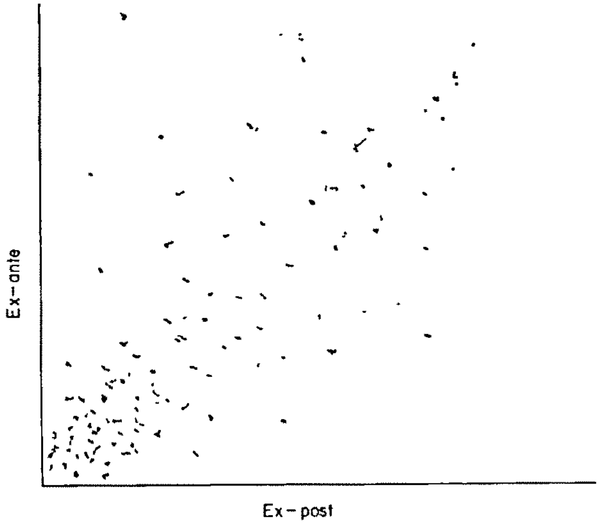


FIGURE 1

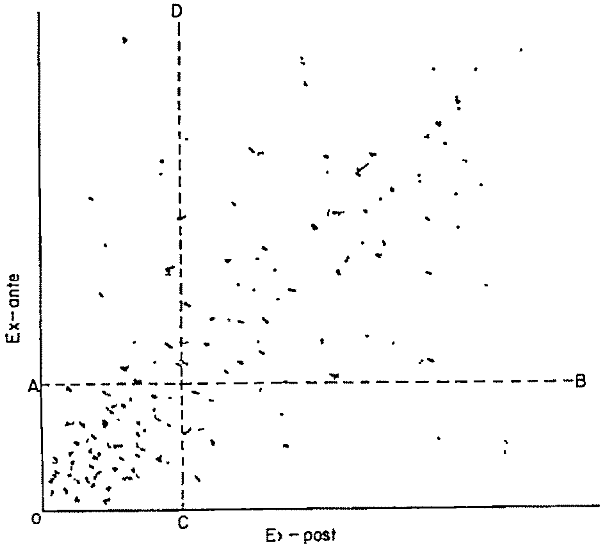


FIGURE 2

ex-post. Figure 1 shows that in most cases estimates were of low value and that that was right. Where estimates were of medium or high value in many cases they were also more or less correct, but there was quite a large spread. (The correspondence was exact only in the case of points lying on a line drawn through the origin at 45° from the axes.)

If we enter the cut-off point below which the library would not think it worthwhile to acquire, and if this point lies OA = OC from zero, the library will acquire volumes lying above the line AB and it should have acquired volumes lying to the right of the line CD (Figure 2). In most cases we see that the discrepancy between estimate and reality does not matter. Books in the south-west quadrant were not and should not have been acquired. Those in the north-east were and should have been. This accounts for the majority of cases. Of the minorities, those in the north-west were acquired but the library will find they are relatively moribund stock on its shelves. In the case of those in the south-east, the library may face explicit demand and be able to acquire them later.

All this has assumed that the value of one item of stock is independent of what other items are stocked. This is clearly not so. For many users one Agatha Christie novel or one American 700-page textbook on Marketing, may be a perfectly acceptable substitute for another. This quality of substitutability together with the opposite characteristic of complementarity (which exists for example between different volumes of the same work) is not shown in the diagram, but it is certainly important. A library may deliberately specialize in one field and neglect another, having in mind not only the needs of its particular clientele but also the accessibility to that clientele of other parts of the total library system.

Decision making in this area, in the light of these considerations, and whether at the detailed (individual item) level or at the policy (subject specialization) level is closely parallel in character to that which is undertaken by a business determining its product line, and particularly by a retailer determining his stock assessment. The same sorts of data are relevant; there are, for example, many studies of what retail customers do when they do not find what they are looking for in a shop—how often they are satisfied with something else instead and how often they then take other action. Similar studies of library users would be relevant to this sort of acquisition decision. The appropriate techniques of analysis for optimization cannot be examined here.

I promised to return to the question of the value of the use made of the library. I do not pretend that this is easy or indeed possible to establish. How is one to value hours of entertainment or instruction, help in the acquisition of useful qualifications, and so on? One would have to be sampling and evaluating the life-style of library users. Incidentally, it is the case that many public service organizations work with readily available figures of their own operations as indications of their success and performance, when information about the population they serve would be more relevant to their objectives. Thus hospitals think in terms of numbers of outpatients, beds, operations, average stay and so forth, instead of about the morbidity and mortality statistics of the population they serve.

In the case of a library providing a service to a task-oriented organization, however, one approach is to estimate the value of reduction of uncertainty in decision making and the contribution of information in reducing that uncertainty. Let us suppose for example that a commercial organization needs to estimate the market for a new product. I measure on the vertical axis the value to it of a correct estimate and the vertical distance from the peak of the curve to any lower point is the cost to it of its estimate being incorrect to the extent shown on the horizontal axis (Figure 3). If additional information can increase the probability of its estimate being within plus or minus one of the true figure as distinct from just plus or minus two, then the value of that information can be readily calculated from the curve.

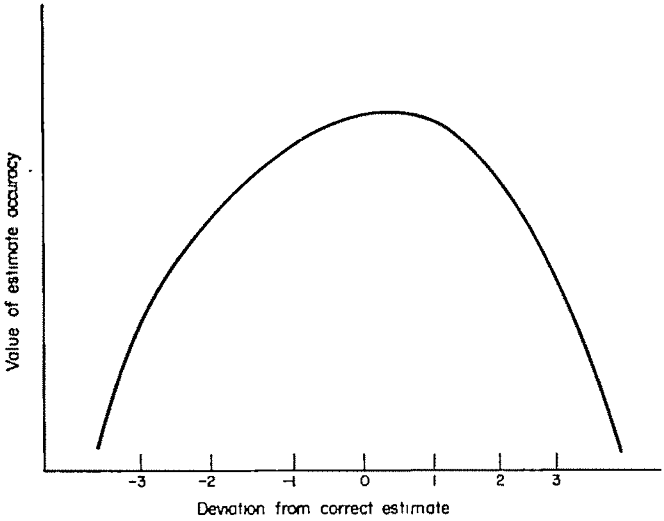


FIGURE 3

TABLE 2

Serial No. of throw	*Heads or tails*	*Numerical value*	*Cumulative average*
1	H	1	1.0
2	T	0	0.5
3	T	0	0.33
4	H	1	0.5
5	H	1	0.6
6	H	1	0.66
7	T	0	0.57
8	H	1	0.625
9	T	0	0.555

Additional information cannot guarantee that the estimate will be nearer to the correct figure; it can just increase the chances. In many cases additional information certainly does this, as for example, if one gradually increases the size of a sample. If one tosses an honest penny, one may begin with results as shown in Table 2. If one counts one for a head and nought for a tail these fluctuate widely—from 1.0 to 0.33—but we all know that, with a long run, the average would have a high probability of being very close to 0.5.

Whatever the value of information it cannot be assumed that potential users will make proper use of libraries despite the fact that they are not usually financed directly by users in proportion to their use. Libraries' services are usually offered free to the public at large or to a particular class of potential user. In these circumstances one would expect a typical condition of over-use, particularly of information services, and a consequent problem of rationing resources. In fact, this does not occur, primarily because library use demands of the user something as precious as money, namely time. Whilst this might seem surprising when something is offered free, libraries nonetheless therefore have a problem of marketing. They need to market because lack of time (and knowledge, and effort) on the part of potential users may result in their being under-used and in the resources provided for them therefore being brought or kept below the optimum.

Marketing is not just advertising. It should start with market research, that is, the systematic identification and measurement of potential demand which the available resources could meet. The research findings should be allowed to affect the service that is being offered, as well as the way in which its availability is made known.

For a mass-produced article, accurate advance estimates of demand, in quantitative terms, are vital, and market research must therefore be based on proper sampling procedures. For an individual library arranging information feedback to which it can quickly adapt, this is not so important. Case studies of use (and non-use) may be more helpful. To the extent that its users are not statistically independent of each other, but may be in close contact, and affect each other's attitudes and behaviour, marketing 'models' based on the concept of leaders and followers, and concerned with diffusion, may be helpful.

Whilst it has not been possible to go deeply into modern approaches to management, even outside the library field, I hope these few remarks will have demonstrated the relevance and utility of some of the concepts used, even where absence of necessary data means that they cannot be precisely and rigorously applied. Even in such situations I believe that familiarity with them can clarify what one is about and the implications for decisions.

DISCUSSION

MR B. STERN (Wellcome Foundation): 'You have described a number of techniques which all seem to require an assessment of the value of a benefit to the organization. This value judgment is extremely difficult. What techniques could you suggest to help an organization quantify benefits in a library context?'

PROFESSOR MCCLELLAND: 'Each individual activity is different; one might be able to identify a benefit or one might not. Only by taking a large number of cases in the form of an array can one get an overall idea of value. One criterion would be a comparative study of the way a group of experienced people make decisions.'

MR P. M. NEWMAN (Fisons Ltd.): 'Apart from the routine transaction, loans, etc, which can be measured in quantitative fashion, there are hundreds of transactions per day in the average library or information service and the consequence of each individual item is small. In the end therefore, the major decisions depend on the experience and intuition of the manager and little on quantitative measurement.'

PROFESSOR MCCLELLAND: 'Judgment should only be made in relation to decisions. Decisions are about the allocation of resources and the factors they must take into account are consequences, good or bad.'

MISS -. COOPER (Strathclyde University): 'I would like to stress the necessity for considering not only our own units and their organization but external local and national sources and services, i.e. not just working in isolation.'

Programmed budgeting and cost effectiveness

D. Mason

Head, Department of Information Retrieval
Studies, College of Librianship, Wales.

Paper presented at an Aslib one-day Symposium on 'Management in a service context', Manchester, 21st November 1972

Introduction

The importance of being able to demonstrate the effectiveness of information services, in terms of value supplied for money spent, needs no emphasis from me. Industry, in particular, has to show a reasonable return on invested capital, and information services can expect to be supported only as long as they demonstrate their worth.[1] Ideally it would be best to be able to put a quantified value on the information supplied, but there is as yet no acceptable method for measuring, or even estimating this value. This is an area in which research needs to be done, and I hope it will be done in the not-too-distant future. However, the fact remains that at present we cannot, except in a very few cases, estimate this value; and although I have recently been taken to task for refusing to grasp this nettle,[2] I remain unrepentant and continue to insist that for the time being we will have to do our best without it.

It remains my opinion, therefore, that a method for demonstrating cost-effectiveness is the next best thing and that in programmed budgeting we have the necessary techniques.

PPBS

The Planning-Programming-Budgeting System, PPBS for short, was designed as a means of providing policy makers with an analytical evaluation of existing and proposed activities, supported, whenever possible, with quantitative measures of performance. The principal part in the setting up of PPBS is the definition of the overall objectives of the organization to which the system is to be applied; followed by the definition of the objectives of particular activities, and the clarification of assumptions made when planning those activities. The aim of PPBS is to analyse expenditure in relation to purpose, and to relate it with results achieved. The questions which have to be asked, and answered, are:

(a) What are the objectives of the organization?
(b) What activities contribute to these activities?
(c) What resources are devoted to these activities?
(d) What is actually being achieved?

A system like this must obviously lead to a form of budgeting different to the traditional budget, in that expenditure is categorized by the purpose for which it is being spent, rather than by the resource, e.g. staff, materials, maintenance, etc. As it is most likely that normal budgeting systems will continue to operate, a method for linking the two, and for keeping them in step, has also to be operated.

Objectives

No doubt each one of us could draw up a list of objectives for our information service, and this is one of the problems in discussing PPBS, in that no two information services are exactly alike. I make no apology therefore for the following list, but offer it as a 'hard core' around which other, and less important, objectives can be grouped.

The objectives of the industrial information and library service are to assist in the maximizing of the company's projects and in the reduction of operating costs by:

(a) Exploiting the literature and other sources of information in order to provide the company's staff with new and up-to-date information on the company's interests.

(b) Providing an efficient and effective enquiry answering and information retrieval system. (You may wonder why I differentiate here but I am sure you will agree that there is a world of difference between the retrieving of information and its presentation to an enquirer.)

(c) Acting as a centre for the company's information services and materials in order to make generally available important documents that might otherwise not be fully exploited.

(d) Acting as a control point for the filing of the company's own reports and related documents, and organizing them for use in order to aid the exploitation of company know-how, and reduce or eliminate duplication of work. (A good reports centre becomes, over the years, a company's corporate memory.)

(e) Building up a collection of periodicals, books, patents and other publications, and purchasing information services available on a commercial basis, on subjects relevant to the company's needs, in order to support the service activities.

(f) Fulfilling all these objectives in an economic and balanced manner so that only reasonable services are provided, and at as low a cost as possible commensurate with effectiveness.

Activities

Let us turn now to the activities which relate to the objectives. Firstly we have to carry out a number of operational activities. Publications have to be selected and purchased, reports have to be acquired, documents have to be indexed and so on. Then there are the service activities, current awareness, information retrieval, reference and loan services. There are several ways in which this list could be drawn up. I have separated the activities into nine main programmes: four operational and five service. These are:

Operational activities

1.0 Acquisition of materials
2.0 Preparation of indexes
3.0 Stock control and maintenance
4.0 Services and systems (Evaluation and research)

Service activities

5.0 Current awareness
6.0 Information retrieval
7.0 Reference and loan
8.0 Supply and distribution
9.0 Training and advisory

Each of these programmes is made up of a number of elements. The following is an example of an operational programme:

Programme code	*Element code*	
1.0		Acquisition of materials
	1.1	Books and pamphlets
	1.2	Periodicals
	1.3	Information retrieval publications
	1.4	Information retrieval services
	1.5	Reports
	1.6	Patents

and an example of a service programme is:

Programme code	*Element code*	
5.0		Current awareness
	5.1	S.D.I.
	5.2	Bulletins
	5.3	Circulation
	5.4	Clippings

Each element has to be clearly distinct from the other elements. In the 'Acquisition programme', for example, information retrieval publications are shown as a distinct element, but it could be argued that they are either in book form or issued as periodicals and do not therefore need to be distinguished. However, there may be many occasions when one would wish to compare the cost-effectiveness of such publications with the cost-effectiveness of in-house indexes in order to decide which to use. There is therefore a case for keeping this type of material as a separate element.

Analysis of procedures

The purpose of and procedures used for each element have to be analysed. What is the objective and how is it carried out? Let us take '1.1 Acquisition of books' as our example:

Element 1.1	*Acquisition of books and pamphlets.*
OBJECTIVE:	To acquire, by purchase or otherwise, and to record the receipt of the books, pamphlets, government publications, trade literature, standards, etc. needed to support or provide the requisite information, reference and loan services.

PROCEDURE:	Bibliographical details of the required publication are verified; the appropriate bookseller or other agent is selected; an order is typed and despatched. On receipt the publication is checked; receipt is recorded; and the invoice checked and passed for payment.

One could, if one wished, carry out a detailed analysis of the systems, but this, though desirable at times, is not strictly required for PPBS. The main purpose is to show why the activity is being carried out, and what tasks are associated with the activity and the sequence in which they are carried out. This should ensure that nothing is missed when staff and material costs are being ascertained.

Costs

The next step of PPBS required that the costs of each element are worked out. The amount of staff time involved has to be ascertained and then converted into the cash value. It is possible with a lot of hard work to achieve an apparently high level of accuracy in the measurement of staff costs. The accuracy may however be illusory. For the purposes of PPBS it is sufficient to round off each cost to the nearest £100 and this means that it is sufficient to get each member of staff to estimate the percentage of time spent on each activity with which he or she is involved.

An average salary rather than an actual salary should be used. This avoids the need to consider whether a group of people concerned with an activity are at the top of their grades, moving up, or, most probably, a mixture of both. Managerial and supervisory staffs' costs should be included in each activity by percentage of time allocated, if it is possible to estimate this. If not, the costs can be allocated over all activities in proportion to the other staff costs involved, by the simple process of adding the Manager's salary to the total professional salaries, and then dividing by the number of professional staff, excluding the Manager, in order to arrive at an average salary which includes his costs.

Separate costs for professional and clerical (or operational) staff should be obtained, because this enables a check to be made on the proportions of work between the two categories in any particular activity; and also to check that in those activities where the professional involvement should be small, this is in fact the case.

To complete the costing process, it is necessary to obtain the costs of any materials or services, e.g. photocopying involved in the activity. One should also include the appropriate costs for maintenance of buildings, heating, lighting, etc., but as many companies allocate these to a central budget, I have excluded them here.

The costs of materials purchased, books, periodicals, etc. should be obtainable from the normal budget figures, although it may be necessary to analyse expenditure in order to find, for example, the cost of purchasing information retrieval publications. The costs of rented equipment such as photocopiers, punched card machinery can be allocated *en bloc* to the appropriate activities. However, the full costs of purchased equipment will have to be worked out.

Let us take as an example a photocopying machine which cost £1000:

Direct on-cost	£
Depreciation: 1/8th of capital cost	= 125.00
Capital: 10% interest charge	= 100.00
Maintenance and repairs: estimated at 5%	= 50.00
Floor space: 10 square feet at £2	= 20.00
	295.00
Materials	
Paper and chemicals for *c.* 5000 copies per annum	150.00
TOTAL	445.00

To these figures the staff costs must be added, and for full costing one would add the indirect on-costs for supervision, heating, lighting, etc., but I will return to these later when dealing with comparative costs.

One final point on costs. When the current costs have been ascertained, future costs can be estimated for up to, say, three years, by adding the appropriate percentages. With rapidly rising costs there can be no certain figure, but 7% annually for increases in staff costs, and 10% for increases in material costs should give somewhere about the right figure.

Costs for operational activities

I have found that a standard form can be used for the costs of each element. The form has separate parts for direct and associated costs. Operational activities have direct costs, and as they exist only as supports for the service activities, these costs have to be transferred to the appropriate services, where they are entered on the form as associated costs. Here is an example of this:

Programme	Preparation of indexes	*Element code*
Element	Reports Index	2.2

	1972 *£100*
Direct costs	
Salaries—Information staff	10
Salaries—Operational staff	2
Materials	2
TOTAL	14

Observed use of Reports Index
Information retrieved from reports (element 6.3) 50%
Identification of reports required for loan (element 7.4) 50%

	£100
Transferred costs	
Element 6.3	7
Element 7.4	7

With the service activities the direct costs are totalled, and then the associated costs which have been transferred from the operational activities. The addition of these two figures gives the full cost of the service. An example is shown in Table 1:

TABLE 1: *Full cost of information service*

Programme Element	Information retrieval Literature	*Element code* 6.1		
		1972 £100	*1973 £100*	*1974 £100*
	Direct costs			
A	Salaries—Information staff	13	14	15
B	Salaries—Operational staff	8	9	10
	TOTAL	21	23	25
	Associated costs			
1.1	Acquisition—books	4	4	4
1.2	Acquisition—periodicals	4	4	4
1.3	Acquisition—IR publications	16	17	18
2.1	Catalogue	2	2	2
2.3	Suppliers Index	9	10	11
2.4	Trade Name Index	3	3	3
3.1	Selection and disposal	2	2	2
3.3	Binding	4	4	4
4.1	Evaluation	1	1	1
4.2	Research	2	2	2
	TOTAL	47	49	51
	GRAND TOTAL	68	72	76

This example shows a fully worked out cost sheet. The direct costs, as one would expect, are entirely staff costs. The letters A and B shown against these refer to the salaries part of the normal budget and this permits easy reference for the so-called 'crosswalk' technique which can be carried out on a computer if desired. Basically it means that the totals of all A's and B's from the PPBS cost sheets should match the total salaries as shown in the traditional budget. This provides a useful cross-check.

The associated costs have been transferred from the elements as shown, with their codes and headings. The forecast figures have been worked out and show that the cost of providing this service will increase from £6800 in 1972 to £7600 in 1974.

Cost effectiveness

Each activity has now to be examined in order, if possible, to quantify its value. A few of the operational activities will have quantifiable benefits and these should be transferred to the service activities using the same proportions as the transferred costs. All the services should be able to demonstrate benefits, but there may be some for which there is no easy way of measurement and for which the benefits will have to be shown as NQ, i.e. non-quantifiable.

This stage of PPBS is the most difficult part of the system. What is the value of an abstract bulletin, or the results of a search for information? As I said earlier, it is not possible at the moment to put a value on information supplied and we must therefore turn aside from cost-benefits and look instead at cost-effectiveness. If we did not supply a certain service, what would it cost the users of that service to do it for themselves? Most of us know our customers only too well, so I think it is safe to assume that in many cases 50 per cent of them would probably do without the service, which brings us back to the value of the information lost!

However here is an example of cost-effectiveness worked out for information retrieval from the literature (I should emphasize that to carry out this sort of calculation you do need to have reasonably accurate figures for the usage made of the service):

Element 6.1

Approx. 3000 enquiries answered annually, 200 of which require lengthy searches. Minimum savings are estimated at £1 per quick enquiry and £20 for a search.

Additionally 200 quick enquiries are answered from the Suppliers Index and 1000 from the Trade Names Index. Further savings accrue from Information Retrieval Publications (element 1.3).

Costs	£	*Savings*	£
Direct	2100	Quick enquiries	4000
Associated	4700	Lengthy searches	4000
		I.R. Publications	3500
TOTAL	6800		
		TOTAL	11,500

As you will see certain assumptions or 'guesstimates' have to be made, but no doubt the system can be refined by more accurate measurement of customer time saved. Perhaps one of you would like to carry out some controlled experiments to this end, that is if you can get your customers to be the guinea pigs!

The system that I have outlined for estimating cost-effectiveness does lean over backwards to be fair. In fact, if anything, it does not put sufficient value on our activities. Nevertheless I have shown, to my own satisfaction at least, that for every £100 spent on information services, there should be a saving of £200 staff time in other departments—and that is not a bad return on capital!

Unit costs

Theoretically it should be possible to calculate unit costs for most library activities in the same sort of way as say the *Builder's Pricebook*. However, practice varies so much from organization to organization that the costs would not be accurate enough to be meaningful. One has only to consider, for example, the costs of indexing. The amount of staff time involved would depend entirely on such factors as depth of indexing, and whether the exercise was entirely intellectual, or partly intellectual and partly mechanized. However, if you do feel the need to have unit costs for your own service, it is not difficult to obtain these from a programmed budget. Taking indexing again as an example, you would know from your budget the total cost of this activity, and from your records you should know the number of documents indexed in the year. Dividing the cost by the number of documents will give you the unit cost for your own service.

Capital expenditure

There are times when we are faced with the problem of deciding which of two items of equipment—for example, photocopiers—we should obtain for use in our unit, and perhaps also whether we should purchase or lease them. Obviously the first factor to be taken into consideration is the quality of the end product. We would not purchase a photocopier that produced prints in which the text was dark grey and the background was light grey! But assuming that we are faced with a choice between two machines, using different processes perhaps, but each producing a copy that is acceptable to our customers, the choice can be guided by calculating the cost per copy, because obviously we are looking for value for money.

First of all then the fixed costs have to be calculated. The machinery will ultimately wear out and photocopying machines tend to have a useful life of about eight years. Then there is interest on capital to consider—that is to say, if the money had not been spent it could have been invested and interest earned. The cost of the floor space occupied, both by the machine and by the person operating it has to be added. One has also to estimate the machine loading. Obviously, although the photocopier is in the library's possession, it can only be used when staff are present, when it is not being repaired or checked for maintenance, and when there is sufficient work for it to be operated. In a library the machine loading will probably be about 50 per cent.

Next the variable costs are calculated, including the cost of maintenance and repairs (covered by a contract, otherwise estimated at 5 per cent), cost of materials, cost of operator's time, and the so-called 'indirect on-costs', which are costs of heating, lighting, supply of electricity, supervision, and costs of staff over and above wages. These are usually estimated at 100 per cent of staff costs.

One final item is the time taken to make a copy; not the machine time, but the total time taken by the operator in picking up the original, placing it in the copier, pressing the button, removing the original, removing the copy. Here is an example:

Direct on-cost	£
Depreciation (8%)	125
Capital (10%)	100
Maintenance (5%)	50
Floor space	25
	300
Estimated machine loading 50% (1000 hrs.) = 0.5p per minute	
Materials	
Cost per sheet of paper	3p
Cost of developing fluid per copy	.05p
	3.05p
Labour	
Averaged to £800 per annum = 1.8p per minute	
Time	
Average time to make one copy = 2.5 minutes	

TOTAL COST
Labour 2.5 minutes at 1.8p = 4.50p
Materials = 3.05p
Direct on-cost 2.5 mins. at 0.5p = 1.25p
Indirect on-cost (100% labour cost) = 4.50p
13.30p

It is almost certain that the sales representative will have told you that the cost per copy would be about 3p, but you and I know better. A similar calculation for the other machine will tell you which one provides the cheaper copy.

Now let us turn to the question of how to pay for what you want. Here, for sake of simplicity, I am going to assume that you have decided to have one particular photocopier but have a choice of rental or purchase. One company offers to sell you the machine for £1000, and your materials' costs will be £500 a year. The other company offers to rent you the machine for £750 per year, the rental includes the materials. Which is the better offer? Obviously the one that costs less. A straightforward calculation, allowing say a five year depreciation at £200 a year plus material costs of £500 per year would suggest that buying averages out £50 per year cheaper than leasing (see Table 2).

TABLE 2

	Year						TOTAL
	0	1	2	3	4	5	
A *Purchase price* (£)	1000						
Materials (£)		500	500	500	500	500	
	1000	500	500	500	500	500	3500
B *Lease* (£)	—	750	750	750	750	750	3750

But we have to consider that money paid out in the future hurts less than money paid out to-day (which is why moneylenders flourish). The question is how much less. Table 3 shows the results of Discounting the Cash Flow at two rates, 5 per cent and 10 per cent, as compared with not allowing for DCF at all. If we think, as well we might in these days, that the 10 per cent Discount factor is about right, then Table 3 shows that leasing is cheaper than purchase.

TABLE 3

DISCOUNT FACTOR		YEAR						TOTAL
		0	1	2	3	4	5	
0	*Purchase* (£)	1000	500	500	500	500	500	3500
	Lease (£)		750	750	750	750	750	3750
5%	*Purchase* (£)	1000	476	454	432	412	392	3166
	Lease (£)		714	681	648	618	588	3249
10%	*Purchase* (£)	1000	454	413	386	342	311	2906
	Lease (£)		681	620	579	513	466	2859

Value concept

Finally, and briefly, I want to refer to the concept of value. The principal objective is to reduce the costs of an operation while retaining or enhancing the quality. This requires that staff be trained to look critically, and on a continuous basis, at all the activities in which they are involved, with a view to getting value for money spent.

The techniques I have already described can provide the quantitative basis on which costs and benefits can be assessed, and can help the Information Manager to demonstrate to his boss that the money is being used effectively. This may not prevent demands being made for reduction in costs, but should enable us to insist that quality and performance must be maintained, and what the economic effects will be if they are not.

REFERENCES

1. MASON. D. PPBS: application to an industrial information and library service. *J. Librarianship*, 4, 2, April 1972, p. 91–105.

2. BLAGDEN, J. Special libraries. *Library Assoc. Record*, 74, 7, July 1972, p. 122–3.

DISCUSSION

DR G. T. WILLIAMS (Shell Research Ltd.): 'Could the speaker say how he arrived at the figures quoted for savings, e.g. £1 per quick search, etc.?'

MR MASON: 'I looked at a series of instances which could be checked and averaged them. £1 for a quick search is probably right but £20 for a prolonged search is probably on the low side.'

MR C. A. CROSSLEY (Bradford University): 'Mr Mason admits that we can only go so far along the road to quantification of "benefits" from a library's information service and his figures provide a modest justification which we hope the purse-string holders will accept as much better than nothing.

In an industrial setting, a figure can be arrived at for "time-saved" of a researcher in terms of money (salary and support costs), but how would Mr Mason set about arriving at a cash figure for time saved for a student, undergraduate or postgraduate, in an academic institution? This is necessary if a cost-benefit analysis is to be carried out in the library of such an institution.'

MR MASON: 'This is not easy to do in an academic situation. Perhaps one could try to evaluate the time saved by a student in relation to the whole cost of educating a student.'

MR P. BROPHY (Library Research Unit, University of Lancaster): 'In answer to Mr Crossley, it may be possible as an initial approach to determine the present cost of providing the service per student and to consider the implications of this cost in terms of the benefits which it implies.'

MRS J. M. SMITH (Manchester University Regional Computer Centre): 'A quantitative approach to an information service in an academic environment can be adopted in certain instances because most students (undergraduate and postgraduate) are tied to a date, whether for project, examination, dissertation or thesis. An attempt can be made to assess how they would have coped without the information with which they have been supplied, and its consequent effect on their project, etc., taking the dead-line and possible marks lost into account.'

DR D. A. LEWIS (ICI Plastics Division): 'Do we know enough about the utilization of time that is "saved"? Many information problems are tackled by scientific staff in "marginal time". Such saving of marginal time may not be a true saving in the sense that it has been used.'

MR MASON: 'True, but taking all customers together we found an overall cost saving of about £2 for every £1 spent.'

MR D. KAYE (Manchester Polytechnic): 'Since Mr Mason mentioned the work of Wills it might be appropriate to raise another approach to the estimation of benefits, namely the avoidance of loss. Present models, like that of Wills and Christopher, require considerable use of subjective judgment, for example in the choice of probabilities. A more concrete example of the principle is in the field of patents. Failure to retrieve a prior publication during a search for novelty that I carried out resulted in the waste of about £1500 in legal and other processing costs, to say nothing of money spent on development and staff costs. On the principle that it is worth spending something short of £1500 to avoid the loss of this sum, it can be shown that a number of successful searches over a year can save a considerable amount of money.'

MR N. L. ANGELL (Shell Research Ltd): 'Can you say something about the allocation of on-costs in relation to the use of external services?'

MR MASON: 'Yes, I omitted on-costs for this sort of comparison. But they can be taken into account and a budget might prove that it was cheaper to go outside.'

MR J. KINNEAR (Burmah Oil Trading Ltd): 'What was the users' reaction to the cost of information, as it is my experience that many users are not aware of the full cost of their enquiries?'

MR MASON: 'I agree. There is, for example, a tendency to look upon photocopying as "free". But in times of serious financial trouble I have found my figures taken seriously.'

Staff management and staff participation

B. G. Dutton

Division Librarian and Section Head,
ICI Ltd., Mond Division

*Papers presented at an Aslib one-day Symposium on 'Management in a service context', Manchester, 21st November 1972**

THERE IS a traditional tendency to think of managers and the managed as two quite separate classes of individual and I should like to make it clear therefore that when I refer to ways in which a manager can improve his effectiveness I am talking about anyone of you who, at a particular moment in time, is achieving his objectives through the agency of at least one other person. I would suggest that by this definition we are all managers, for even those few who in their jobs do not work through a subordinate must, in order to approach their objectives most effectively, manage either their peers or their seniors.

Staff can seem at times to behave illogically, perversely, and unpredictably. Contrary to the belief of some, the good management of staff is not just a matter of common sense. It is common sense in the context of an environment which has been moulded by social influences, technology and other large-scale forces, and group behaviour, whether in the office or at a football match, is not the sum of a set of individual behaviours. To manage staff well requires a formal effort to grasp the import of these influences so that our individual attitudes can be controlled and developed to meet the day to day staff situation in a way in which empirical common sense will have difficulty.

It is particularly important that the manager of a service organization like a library or information unit makes this effort for two reasons:

—firstly, his product, being service, is closely linked with the attitudes of serving staff themselves and it is not possible by inspection to reveal a faulty service in the easy way that faulty materials can be detected, and
—secondly, the cost of labour is likely to continue rising at a greater rate than that of the manager's other main tools, machinery and materials, and he must therefore use the staff he really does need to best advantage.

To set the perspective for my remarks on participation I would like to spend a few moments outlining the four major styles of Western staff management which have been practised since the Industrial Revolution. The earliest of these rested in the notion that one's life on earth and entrance to Heaven were predetermined and so no action was necessary to better the condition of one's staff. This, so far as I am aware, is no longer overtly believed—the poor may sometimes justly deserve to be poor but they no longer expect it. The other three styles are all in evidence.

---

* The views expressed here are my own personal ones and not necessarily those of either the Mond Division of ICI for which I work, nor those of ICI Ltd as a body. Nevertheless I am most grateful for information I have received from various colleagues in the Company.

The earliest was 'scientific management' and had, as a main postulate, that man was an inefficient machine motivated solely by money; hence the most efficient form of organization ought to be one where each job was broken down into simple components, with the worker skilled in only one aspect of the job. On a piece-rate basis this led to his earning more; hence it was concluded that the most efficient organization would also be the most satisfying. Although piece-rate practice is not characteristic of libraries the job breakdown approach is still in evidence; a good example is the splitting of tasks associated with the key-punching of information.

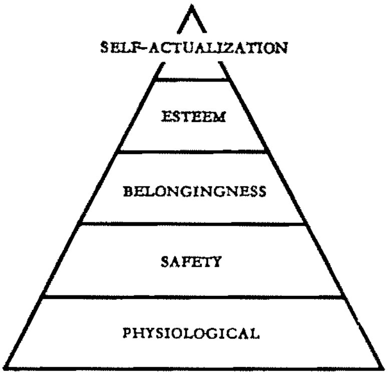
In the late 1920s, humanist theories of behaviour developed which recognized the influence of the working group on the individual member and argued that the job should be fitted to the worker. In particular, very extensive series of experiments on worker behaviour were carried out in the US at the Hawthorne Laboratories of the Western Electric Company and from the results of these it became clear that output was affected more by management interest in the job than by variation in physical work factors. This influence has always to be borne in mind when personnel experiments are carried out. Thus the tenet of scientific management was turned round—the most satisfying organization was expected also to be the most efficient.

More recently, a major consequence of the changing social environment has been a decline in the concepts of work and of conforming as virtues in favour of a more permissive and persuasive approach, both at home and at school. This has conditioned younger people in particular to expect to be consulted and to have some part in deciding courses of action that they must follow.

Behavioural scientists sought to rationalize these changing attitudes by suggesting that an individual is motivated by two classes of need—basic needs and those that are socially determined and that both of these must be satisfied to allow emotional maturity. These various needs have been helpfully portrayed by an American psychologist, Maslow, as a five-level heirarchy[1] and he suggested that as one type becomes satisfied, and only at that point, the next higher type begins to exercise a subconscious motivation on the individual. Maslow's heirarchy of needs is shown in Figure 1.

Looking at this we can see that the needs expressed by the two lowest layers of the pyramid are, for the most part, automatically satisfied by Western society —basic physiological needs such as food, clothing and shelter on the one hand, safety on the other, are all built into the normal working environment. Thus these needs are no longer motivators. It can be said that man lives by bread alone only when he has none.

Management techniques become valuable in developing high work involvement from the satisfaction of needs from the third level upwards—social, ego and self-fulfilment needs. Thus, if we consider social needs, a recruit to an organization is seeking membership of a work group and acceptance by the group depends on his conforming within a reasonable time to their ways. These ways will include quality and quantity of work performance. External courses of the type run by Aslib can play a valuable supplementary role in the training process—indeed this is important justification for my own Division being in Aslib—but the existence of external courses should not become an excuse for the neglect of in-house training or the integration of the individual into the unit will suffer. More benefit accrues if the individual comes to the external course generally knowledgeable on the way his own unit does things. A facet of training which could usefully be further developed is the provision of courses or course materials to create trainers themselves.



Self-actualization = the climax of the individual's needs whereby his own potentialities are realized fully
Esteem = the social needs of success, esteem, prestige, etc. come into play
Belongingness = the individual develops the need for belongingness and love
Safety = attention is turned to safety, security, order and routine
Physiological = a seeking to satisfy basic primary needs

FIG. 1: *Maslow's 'heirarchy of human needs'.*

Once a new member feels that he belongs securely, Maslow suggests that he becomes receptive to signals of esteem for what he does; he wants to do worthwhile things well, to be recognized as a good performer, to be accorded prestige for what he is doing. An important technique in this area of needs is the well planned job evaluation scheme. This can provide a means of recognizing benefit from training and development, as well as a standard of grading for initial entry. It can also introduce an element of promotional incentive not otherwise readily available in a small unit. Boodson, at an Aslib conference on In-training of Library and Information Staff two years ago,[6] discussed a practical approach being made within ICI to staff job assessment in a special library organization. The ICI method lays stress on the need to distinguish between the tasks in a job and the personal qualities of the incumbent. Careful distinction between the two results in a much smaller number of job requirement factors being necessary and concentrates attention on the objectives of the unit. This is important since personal performance can be allowed for by means of salary increments. Finally, when all other needs have been satisfied, man seeks self-fulfilment—he has a basic potential for achievement and self development and needs to fulfil it.[10]

An extension to the theory of needs which has important practical implications is due to Herzberg[2] who made an extensive examination of claimed job satisfactions and dissatisfactions among various classes of professional and non-professional staff in developed industrial countries and found that the causes of satisfaction were not the same as the causes of dissatisfaction. If factors providing satisfaction in a job-situation were absent and Herzberg called these 'motivating factors', the result was not dissatisfaction but simply indifference. Likewise, if causes of dissatisfaction were absent and Herzberg called these 'hygiene factors' the result was not satisfaction but, again, indifference. The factors identified are shown in Figure 2.

In this figure, lines to the left of 0 relate to active dissatisfaction and lines to the right relate to active satisfactions. The length of a line relates to the relative number of occasions on which the factor was raised and the width relates to the persistence of feelings generated.

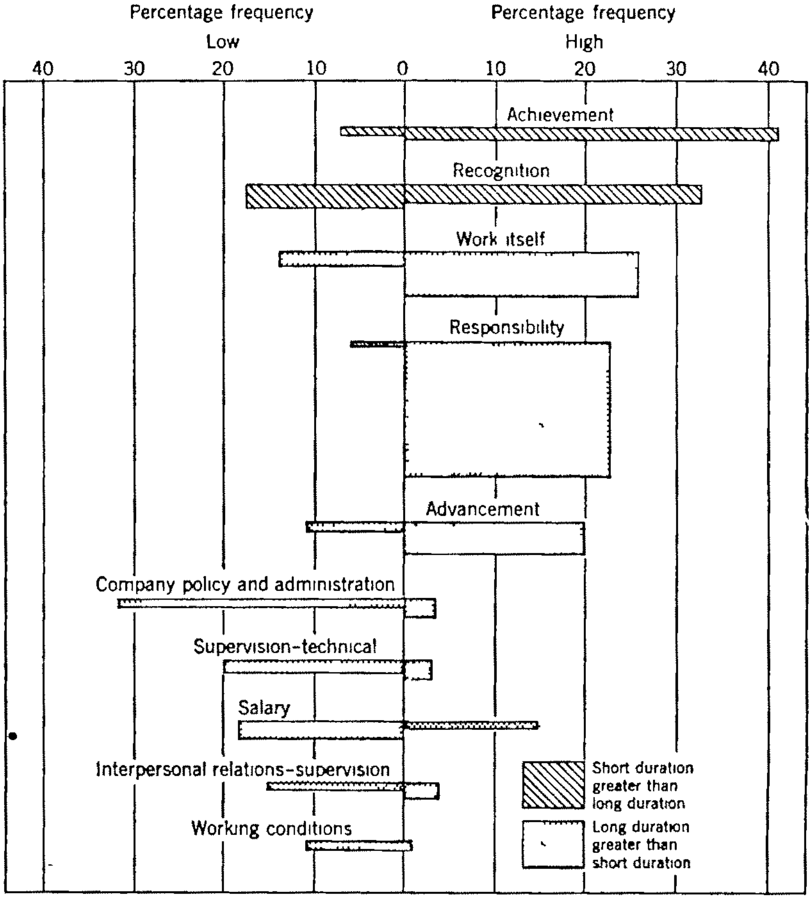


FIG. 2: *Comparison of Hygiene- and Motivation-Factors.* (Reproduced by permission from HERZBERG F. *et al. The Motivation to Work.* 2nd ed. Wiley, 1959.)

Thus, when company policy was poor, many staff felt active dissatisfaction, but only for short periods, whereas a good policy raised very little interest—it was taken for granted.

Again, absence of opportunity to take responsibility caused little active resentment whereas in those environments where there was an encouragement to take on responsibility, not only was there marked satisfaction but it was of long duration.

If we look at the factors involved, it is clear that the factors which gave active satisfaction when present are in the highest strata of Maslow's heirarchy, whilst those which caused most dissatisfaction when poor relate to the lower three Maslow layers.

These studies suggest that in developing staff we need to recognize two fundamentally different types of effect on motivation relating, respectively, to hygiene factors and to motivation factors. Further, whilst the hygiene factors must be considered first, it is only necessary to ensure that these do not get out of line. The only practicable method for doing this is through comparison with other similar units. It is not profitable to become continually pre-occupied with improving these aspects of the work. Rather, we must concentrate on trying to improve the motivation factors through the better organization of work, and experience points to staff participation as being a highly effective means for doing this.

What is meant by staff participation? It is essentially an active co-operation between manager and subordinates in the setting up and pursuit of agreed job-related objectives.

The unit's overall long-term objectives within any larger organization will need to be determined initially, but once this has been done the medium term objectives and the short term improvement targets must come from the staff themselves.

Participation is not synonymous with downward consultation. Downward consultation is motivational only to the manager who is trying to make the right decision and get it accepted by the group. The subordinate does not have to live with responsibility for the consequences and indeed may become frustrated since, although consultation is involvement, it denies him the exercise of personal responsibility.

Participation demands real commitment by everyone involved. Commitment by the management must come first because there lies the authority.

Any suggestion of a blow-hot, blow-cold attitude to styles of staff management can be very damaging to the unit's objectives. The manager must be in full control of his own job—if he is excessively preoccupied with his own worries his sensitivity to the perceptive limitations of others will be low. He must be fully prepared for all his unit's activities to come under question. Commitment of the subordinate, to be effective, must be self-generated, and hence will come about only as a programme develops. There will then arise upward consultation in which both parties are motivated—the subordinate is motivated by the need to make the best decision and the manager by the need to develop his staff.

At this point I make no excuse for digressing to discuss the most fundamental of all management techniques—communication.

Drucker has made three pertinent observations on this subject:[3]

1. It is the recipient who communicates; the so-called communicator only utters.

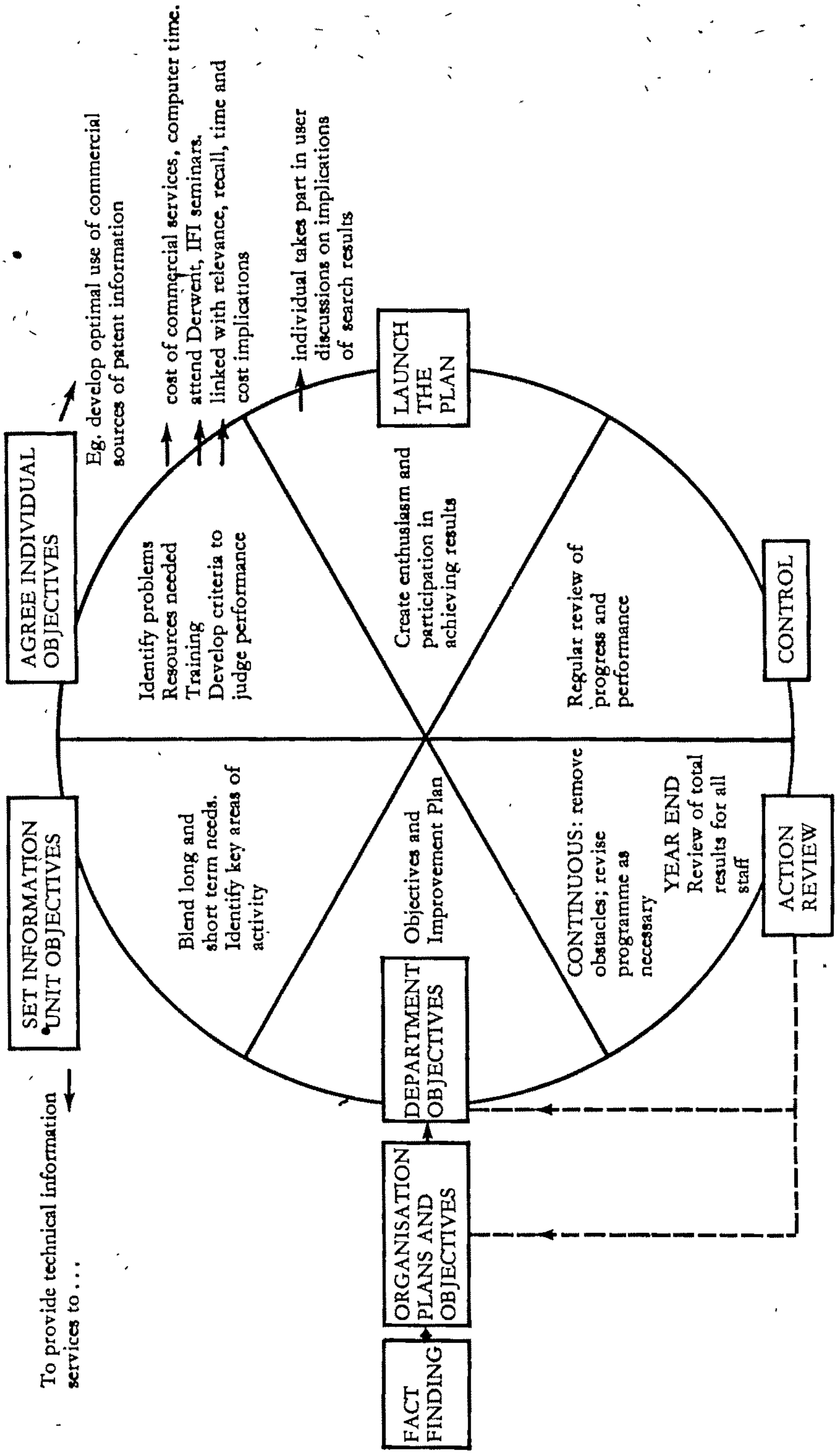

FACT FINDING
ORGANISATION PLANS AND OBJECTIVES
DEPARTMENT OBJECTIVES
SET INFORMATION UNIT OBJECTIVES
To provide technical information services to . . .
AGREE INDIVIDUAL OBJECTIVES
Eg, develop optimal use of commercial sources of patent information
cost of commercial services, computer time.
attend Derwent, IFI seminars.
linked with relevance, recall, time and cost implications
individual takes part in user discussions on implications of search results
LAUNCH THE PLAN
CONTROL
ACTION REVIEW
Blend long and short term needs. Identify key areas of activity
Identify problems
Resources needed
Training
Develop criteria to judge performance
Create enthusiasm and participation in achieving results
Regular review of progress and performance
CONTINUOUS: remove obstacles; revise programme as necessary
YEAR END
Review of total results for all staff
Objectives and Improvement Plan

FIG. 3: *Management by Objectives—a Dynamic System* (after Humble).

2. People can only understand within the limits of their experience (a point long recognized by teachers of rhetoric, but forgotten again and again by practitioners of communication).
3. People as a rule perceive only what they expect to perceive—here I am not thinking of the few who might resent the truth but the many who do not absorb the unexpected at all or, worse, who mis-see or mis-hear it as the expected.

The problem of communication cannot be solved simply by listening more carefully, since if a manager cannot communicate downwards, it is even more difficult for a subordinate to communicate upwards.

An appreciation of the true nature of communication is essential to give meaning to the most important step in fostering participation—this is for manager and subordinate to develop a dialogue focused on objectives that are real to both parties. A first step in such a dialogue is for the manager to ask his staff to think through what they, as individuals, see as the major contributions to the unit that they should be expected to provide and be held accountable for. The answer will rarely be the expected one, but the first aim of the exchange is precisely to bring out this divergence in perception—once both parties realize that they see the same reality differently, we have the beginning of true communication. As the dialogue develops, the intended recipient of communication—in this case the subordinate—is given access to experience which enables him to understand. He is given access to the reality of decision-taking, the problems of priorities, the choice between what one likes to do and what the situation demands and, above all, the responsibility for a decision. He rarely will see the situation in the way his boss does—perhaps he should not—but he may gain an understanding of the complexity of the superior's situation and, above all, of the fact that the complexity is not normally of the superior's making, but is inherent in the situation itself.

The concept of the individual being encouraged to suggest and adopt individual job targets has been formalized as a specific management technique—Management by Objectives.[4]

The first steps in any formal MBO programme are to establish Departmental and Unit objectives with higher management and to identify those key areas of activity which must be undertaken for their achievement. The individual can then be encouraged to relate his own working to these objectives by an iterative approach as indicated in Figure 3.

Firstly, personal objectives need thinking out;
—then, resources needed, training required, and likely problems all need identifying;
—the programme can then be agreed with the manager and criteria developed to measure progress and judge performance;
—at this stage, the plan can be launched;
—subsequently, performance is reviewed periodically;
—improvements are consolidated into standard performance;
—new improvement targets are agreed and objectives updated.

Even when it is thought inappropriate to operate a formal MBO programme informal application of the principles involved can form a valuable framework for developing motivation and participation.

Whether a staff participation programme in turn should be formal or informal will depend on the circumstances of the unit involved. A formal programme may be decided on if a clear increase in productivity seems called for (and this was the case in ICI), or if morale is low, but I must stress that adoption of a particular style of personnel management will rarely solve problems *per se* but should be used to provide a framework for constructively synthesizing a working environment. Changes in attitude do not occur overnight. In the ICI programme, for example, it was anticipated that at least two years would elapse before the work attitudes developed during the formal Staff Development Programme became a normal mode of behaviour. Particular care must be taken that a change in style does not sew the seeds for its own destruction—thus, to cite an extreme situation, an increase in productivity must not be followed by the creation of immediate enforced redundancies.

A formal programme, in turn, can be introduced on small or large scale—the advantage of the latter is that everyone is in step, otherwise changes which involve inter-action with a non-participating unit may fail for lack of motivation on the other side; again, a more systems-based approach is practicable, lessening the chance that an increase in productivity of one part of the unit will lessen that in another part; also more productive use can be made of commercially available supporting material, such as films, etc.

Some criteria which were developed to measure progress by my own information unit are set out in below:

1. Adoption of individual targets—deep knowledge of areas of technology, information services, languages, etc.
2. Definition of training needs—having established individual objectives, staff were encouraged to select meetings, courses, etc. to promote relevant expertise and subsequently to pass on information gained at in-house seminars. This proved a good test of their own understanding and replaced, in our case, an earlier attitude of a ration of courses for everyone regardless of value.
3. Extent to which all aspects of work are subject to self-examination. One of our counter staff spontaneously did a quantitative comparison of borrowing success rate for books between other ICI Divisions and the NLL which resulted in us reversing our standard practice.
4. Openness in discussing and solving problems. Involvement of counter staff from the beginning in studies on a mechanized loans control programme resulted in valuable suggestions on practical points.
5. Elimination of unnecessary work, e.g. by identification and justification of the least important tasks done. Excessive checking is often detected here.
6. Acceptance of more exacting work—shortening lines of communication through effective delegation with decision-taking nearer the sources of information and action. More exacting work should not be confused with more work and whilst any major increase in responsibilities can be rewarded financially at an appropriate time, direct linking of increased participation

with financial reward should be avoided—this is partly because, as I have said, money is a hygiene factor and as such has only a transient effect on work attitudes and partly because to do so is effectively to prostitute the increased motivation.

7. More optimal use of mechanized methods.

If an organization elects to send any of its staff on an external course it is imperative that it either operates or is actively sympathetic to the type of management covered; otherwise the learning could be disastrous by putting the attendee severely at risk.

A useful technique which enables the manager to relate his own particular style of management to the many possible is representation of style as the interaction of two variables—concern for output and concern for people. These variables are conventionally assigned a range of intensities from 1 to 9 and by representing them as the x and y axes on a grid, it is possible to chart a wide array of managerial styles (see Figure 4, the 'Managerial Grid').[5] In particular,

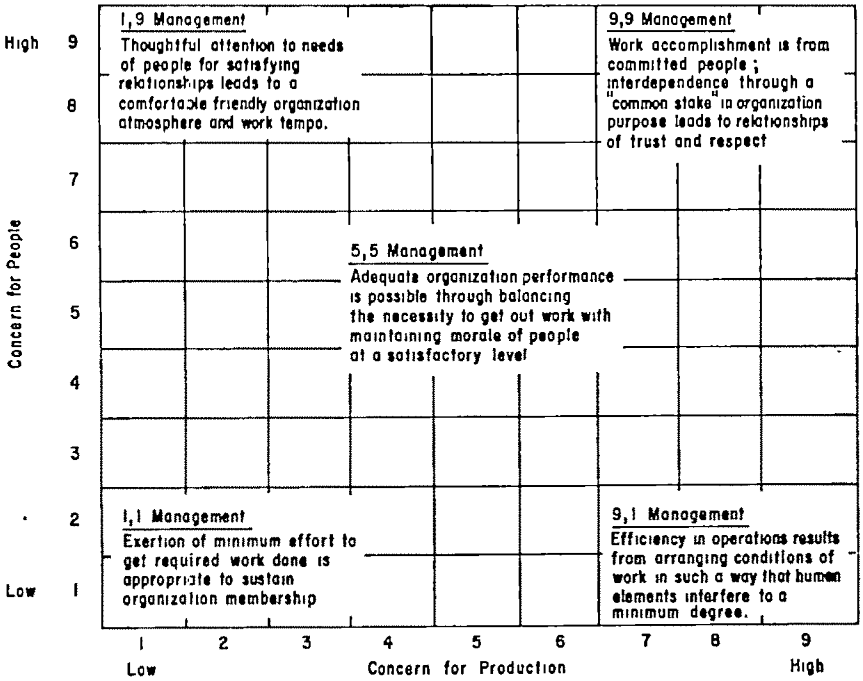

1,9 Management
Thoughtful attention to needs of people for satisfying relationships leads to a comfortable friendly organization atmosphere and work tempo.
9,9 Management
Work accomplishment is from committed people; interdependence through a "common stake" in organization purpose leads to relationships of trust and respect
5,5 Management
Adequate organization performance is possible through balancing the necessity to get out work with maintaining morale of people at a satisfactory level
1,1 Management
Exertion of minimum effort to get required work done is appropriate to sustain organization membership
9,1 Management
Efficiency in operations results from arranging conditions of work in such a way that human elements interfere to a minimum degree.
High
Low
Concern for People
1
2
3
4
5
6
7
8
9
Low
Concern for Production
High

FIG. 4: *The Managerial Grid* (reproduced from BLAKE R. R. *and* MOUTON J. S. *The Managerial Grid*, with permission from Scientific Methods Inc., and Gulf Publishing Co.).

the four corners of the grid and the centre represent five major styles of management and if one can recognize that one's attitude to a particular job situation stems from one of these styles, a deeper understanding of one's overall approach to staff management can be gained. Colley, for example, has linked attitudes to training library staff with managerial style.[7]

The (1,1) manager has minimum commitment both to output and to people—in the training context, to quote Colley, he will quickly pass his staff onto his subordinates or to the training officer.

The 9,1 manager concerns himself only with production—he sees people as tools—if he can get a better tool he does; otherwise he puts his staff in for training and expects immediate improvement. Although such a manager can often achieve good results his subordinates may be driven to adopt defensive attitudes; he also tends to precipitate win/lose situations.

The 1,9 manager is the converse and believes that if you look after people, production will look after itself—thus he sends people on courses to keep them happy. This style is particularly common in a service organization because quantitative performance criteria are more elusive—the danger lies in its obvious cost-ineffectiveness in times of crisis.

The 5,5 manager is also common in a service organization—he tries to balance people against output, believing that too much emphasis on either can only be detrimental to the other. The weakness of this style lies in the large amount of effort needed to maintain such a balance—this results in traditions and precedents being invoked to promote stability. The manager becomes preoccupied with administering rules and regulations or establishing new precedents and has little time either to encourage initiative by his staff or to solve new problems of output. It is a second-best style which shows up poorly when innovation is called for.

The 9,9 manager on the other hand sees that a desire for high output and an intense interest in people, far from being incompatible, are complementary qualities and his unit is likely to benefit most from staff participation—in the context still of Colley's example, he sees that training is continuous and needs to satisfy the needs of both trainee and unit, and in turn he seeks commitment from both.

In both formal and individual approaches to participation hygiene matters are likely to be raised first; some trivial, some more deep-seated and they must not be dismissed with impatience. Cases will usually be found where there is no rational reason for something not having been put to rights.

Some hygiene areas, such as Company Policy and Administration, we may consider too large and general for any meaningful action to be taken, but it is particularly important that, as managers, we should seek full understanding. However much we personally may wish to be dissociated from attitudes with which we do not agree, in the eyes of our subordinates, and indeed of the world at large, we are the management and the Company.

My own unit became involved in a staff development programme as part of a formal Company exploration of the practical implications of Herzberg's motivation/hygiene theory. It was considered that the bulk of attention to staff in the Company in the past had been concerned with task environment—pay and conditions, job security, supervision, communications and joint consultation, and indeed any neglect of these hygiene factors could have had disastrous consequences. But at a time when there was a premium existing on individual effort, with labour becoming too costly to waste, it was felt that more attention needed to be paid to the motivators.

Once the decision to initiate a formal programme of staff development had been taken, steps to carry out the dialogue I have already mentioned were left to the individual Divisions of the Company to determine and, in turn, within the Divisions each operating unit was left free to develop its own approach. The only contribution provided centrally was initial management training in behavioural science theories for a small number of key individuals to ensure a competent and informed start for individual programmes.

Library and Information Centres equally with other units, both service and line, partly selected and partly elected members to receive training in turn so that an effective dialogue became possible through groups at all levels. To encourage the widest sharing of experience, in addition to homogeneous work groups, representative groups comprising staff of different grade levels and in different disciplines also explored common problems.

As anticipated, hygiene factors predominated initially but a constructive approach to these resulted in attention moving towards motivational factors. Thus individual staff from the most junior began to analyse and discuss their individual jobs, in the light of library operations; to single out and express the important elements and existing shortcomings, and to suggest methods for improvement. A number of such operations, previously spread over several individuals, were reconstituted and total responsibility alloted to one person.

With regard to interpersonal relationships within a unit, use of individual objectives to measure performance can make much more pleasant one of the more disliked staff management techniques—that of performance assessment. Traditional procedures seem to range from complex form filling to informal observation. The prize in the former area would seem to go to a New York library system which is reported to expect supervisors to assess staff on 373 qualities before writing an overall summary.[8]

In a participative atmosphere using some form, even qualitative of MBO, the assessment can become more constructive. Both sides have good lead-in; criteria of performance have been jointly developed and performance reviewed periodically during the year. I personally have always felt a suitably written form to be helpful in directing thought to the most important issues, but this has now become essential in the light of the IRA in that in the event of a dismissal on the grounds of lack of capability, a tribunal can call for written assessment records as evidence.

For a meaningful discussion the assessors must of course be familiar with the subordinate's work and this means not being too far removed from the assessee's own level. The assessee must at the same time feel confident that his assessors are people with authority to recommend meaningful action on his behalf; hence the system depends on effective liaison and delegation in this respect from the personnel department.

Thus I would suggest that in developing and assessing staff, emphasis should be on job objectives. Consideration of personality traits as such should play little part. The human personality is a complex and highly abstract concept and attempts to judge the individual in terms of his personality are likely to induce long-term hostility and block fruitful communication.

However, to refrain from judging personality is not the same as ignoring either its strengths or its weaknesses—a work situation which strives for congeniality, homogeneity and conformity may exclude the innovator and change agent.

In much team work the personalities of those concerned can play a major role in determining the degree of success. Considerable attention has been given by behavioural scientists to the formal study of interpersonal relationships with the aim of encouraging a deeper insight into the background to motivation and behaviour specifically in a work context. It is in the specificity of context that such studies which have variously been called Group Dynamics, Sensitivity Training, T-Group Training, etc. differ sharply from psychotherapy.

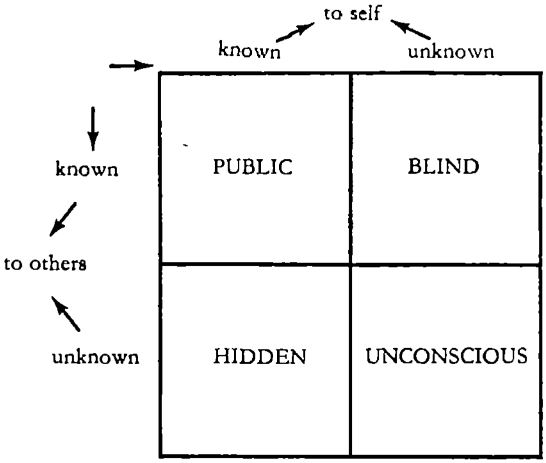


FIG. 5: *Classification of interpersonal behaviour.*

Four major behavioural areas can be distinguished and are illustrated in Figure 5. These are Public, Hidden, Blind and Unconscious and the object of Sensitivity Training is to increase public area, decrease the blind and hidden areas but to ignore the unconscious area. Any group of individuals acting together can be observed at two levels:

(a) what is said and decided;
(b) what is felt: the stresses and strains within a Group—the existence of these vitally affects the outcome of group actions and the difficulty of interpreting them, even at first hand, is a major reason why very senior people are prepared to suffer considerable inconvenience to attend meetings in person rather than, say, by TV link-up.

Not only does Sensitivity Training try to reduce the unknown aspects of personality but identification of these aspects can often lead to their being put to constructive use; apparent weaknesses can become strengths.

In its purest form, the training builds up from unstructured sessions in which participants are left to choose their own topics for discussion in the presence of observer trainers. In this form, there is always risk of generating undesirable destructive hostility between participants and a more useful approach for groups in which the members know each other, or even work together, is to use structured problem-solving sessions or courses under trained leaders to cover both task objectives and also the influence of personal attitudes.

The third area of staff management I wish to consider concerns relations with staff outside the unit. There are two classical approaches to organizing staff in relation to their work: the functional approach, which groups together like means; and the project approach, based on identity of purpose. Each has its merits and disadvantages. The functional approach is reported to be most successful in a stable work environment. Here the disadvantages of having discipline-based groupings with little motivation actively to serve users' needs is relatively unimportant—the traditional library worked in this way, and only five months ago a contributor to *New Library World* felt able to write that: 'Many public libraries are grotesquely remote from the mentality of the majority of the public they are presumed to be serving.'[9] On the other hand, the advantages of the project approach, with its concept of a multi-disciplinary mobile work-force which can quickly be switched from problem to problem, must be off-set against difficulties of effective conservation and deployment of specialist resources and a lesser sense of security among staff involved. A third approach which has recently received attention is the technique of Matrix Management.

In a Matrix organization each member of the staff is responsible to two managers—a project head with mission responsibility and a subject head responsible for maintaining professional expertise. This affords a mechanism for overcoming the insecurity which can arise in a project-oriented management system as projects come to an end, since it should be the professional subject head who is responsible for handling personal problems and career development of his staff.

Under such a system, the subject head surrenders that part of his traditional responsibility dealing with control of the performance of his staff whilst actually on a given job, but his subject responsibilities are increased in that he must ensure that his staff are fully aware of and interact with the present and future needs of the project groups. The project head in turn must facilitate the arrangement by ensuring that each member of his team is given a job that requires solid capability and is achievable.

A number of British public library systems appear to be actively exploring an informal approach to matrix management. Thus the structure of the Leicestershire County Library system is reported[9] to include a number of field terms whose individual members each have responsibilities in four distinct areas: functional (such as local history); user related (with a particular community); project-related (e.g. developing relations with industry); and service-related (responsibility for a specific group of libraries).

In the case of the industrial library's staff member whose primary qualification is usually in a subject discipline, a matrix system can be valuable in imparting a sense of belonging to the users' team; he ceases to be regarded as an outsider.

A group of staff who require very careful managing by the information service unit are the by now well-known 'gate keepers'.

A 'gate keeper' functions best as a mini information analysis centre with his gate keeping being almost unconsciously ancillary to his creative work. It is wise to take special pains to meet his requests and ensure that your junior staff can distinguish him from the squirrels and butterflies but leave him his freedom! A simple technique worth bearing in mind when trying to get things done voluntarily through others is to maximize overlap of objectives. The person you approach may be in full sympathy with your own objectives, but unless you can demonstrate some overlap with his, he may well be too busy to act for you.

Finally, one may ask whether the management techniques which I have described will ward off redundancies and dismissals. The answer is a qualified yes—if the line side of an organization has to cut back, the service side cannot expect to avoid a proportional cut and the wise manager as part of his long-term strategy tries to strike a balance in his staff which will allow a limited flexibility under such circumstances, but the keyword is 'proportional'. If one has developed an atmosphere of staff participation within the unit so that the essential is being continuously distinguished from the trivial, then it can be expected that the key customers of the service unit will be continuously exposed to the full benefits of a good service which really fulfils their needs; and during any temporary phase of organizational stress one can expect enough key people to stand up and demand that undue discrimination is not practised against the unit in any reduction plan.

REFERENCES

1 MASLOW, A. H. A theory of human motivation. *Psychological Review*, 50, July 1943, p. 370–96.
2 HERZBERG, F. *Work and the nature of man.* The World Publishing Co., 1966.
3 DRUCKER, P. What communication means. *Management Today*, March 1970, p. 91–3, 150–51.
4 BIM Library Bibliography *Management by objectives* is a useful guide to basic reading.
5 BLAKE, R. R., *and* MOUTON, J. S. *The Managerial Grid.* Gulf Publishing Co., 1964.
6 BOODSON, K. The significance of staff structure and promotion policy. *Aslib Proceedings*, **22**, 6, June 1970, p. 267–75.
7 COLLEY, D. I. Co-operative schemes for in-service training. *Aslib Proceedings*, **22**, 6, June 1970, p. 276–81.
8 PEELE, D. Some aspects of staff evaluation in the UK and the USA. *Library Association Record*, 74, April 1972, p. 69–71.
9 JONES, K. Staff deployment. *New Library World*, June 1972, p. 320–23.
10 Two recent items of general interest in the libraries/information field are:
  (a) STONE, E. W., *ed.* New directions in staff development. *American Library Association.*
  (b) STONE, E. W., *Issue ed.* Personnel development and continuing education in libraries. *Library Trends*, **20**, July 1971.

DISCUSSION

MR D. KAYE (Manchester Polytechnic): 'Is it not true that the same person may appear in different boxes in the management grid at different times, depending upon how he feels at those times?'

DR DUTTON: 'Yes, but the object of the grid is to focus and clarify attitudes to management and stimulate thought about one's own position and practice.'

MR D. MASON (CLW): 'Most fashions in management techniques seem to start in the USA and then get promoted over here by organizations offering expensive training courses in the techniques. Participative management has fortunately turned out to be an effective technique, but this is not true of some of the other techniques.'

DR DUTTON: 'There is danger in being caught up in the latest fashions. ICI tried to explore some of the theories put forward in a series of experiments. One of the conclusions was that the real difference between motivation factors and hygiene factors had been demonstrated.'

MR W. R. PICKERING (Wellcome Foundation): 'There appears to be a contradiction in the concept that participation and remuneration should be kept separate whilst participation and assessment are to be kept together. Assessment surely leads to reward. Our experience is that this situation can lead to competitiveness amongst staff and, if possible, Management by Objectives and assessment should not be directly linked or at least not overtly so.'

DR DUTTON: 'We didn't find this correlation between remuneration and assessment. Assessment is done not just to decide remuneration—it is an aid to the individual in his career. Nor did we find that this process made people undesirably competitive.'

MR C. A. CROSSLEY (Bradford University): 'What success is there on record of persuading *workers* not to be obsessed by reward?'

DR DUTTON: 'Rewards are not handed out every day and the aim is to have long periods between rewards of trouble-free conditions. If this happens then the system might be judged to be successful.'

MR K. BRADBURY (DOE): 'Appraisal interviews in the Civil Service do give the opportunity for subordinates to discuss freely their position and put forward criticisms of their immediate suggestions where necessary. This applies only to certain grades.'

MR D. WHALE (Tube Investments): 'To what extent in your experience does an annual job interview reveal hidden problems and ideas of junior staff—assuming that a reasonable staff relationship has already been established?'

DR DUTTON: 'Before interview each member of staff is invited to write down his own objectives and say how he thinks he has met them. This is commented on by his senior and sent back to the staff member so that he is fully prepared before he comes to the interview.'

MRS J. ANDREW (BBC Film Library): 'At the BBC an annual assessment report is made in writing by immediate line manager followed by an interview with the line manager's manager at which the individual is shown the report, before discussion.'

MR J. KINNEAR (Burmah Oil Trading Ltd): 'Is additional responsibility for a particular person always a good thing? In my experience some people are happy as they are and to try to encourage them to take on more responsibility may have an adverse effect.'

DR DUTTON: 'Increased participation must be voluntary. Performance will then either improve or remain unchanged, but will not deteriorate.

MR W. R. PICKERING (Wellcome Foundation): 'Is matrix management practicable?'

DR DUTTON: 'Yes. We are finding it one of our best methods. People are fully integrated with the people they are serving while still being in the main stream of management.'

BRIEF REVIEWS

CHISHOLM, MARGARET E. Media indexes and review sources. College Park (Md.): Maryland University, School of Library and Information Services, 1972. 84 pp. $4.75.

An attempt is made to assist in making non-print materials more readily accessible to the user and identify sources of evaluative reviews. Media review sources are first considered for their currentness, and limited to those titles published within the last ten years. Selection of periodicals is limited to those most readily available to libraries, which eliminates many journals with small circulations and those with readership primarily in the industrial and commercial sectors. The following types of indexes and media review literature are evaluated: periodicals in the media field, general indexes and lists of media, lists of media organized by subject area, guides to free or inexpensive media and producers' and distributors' catalogues. A bibliography with comments is provided plus a guide to subjects and an index to sources by type of media.

MOUNT, ELLIS, *ed.* Planning the special library: a project of the New York Chapter, SLA. New York: Special Libraries Association, 1972. 122 pp. $ 7.50. *SLA Monograph no. 4* (SBN 87111 2051)

This is a volume of seminar papers with an emphasis on planning for the special library, although many of the principles and practices discussed could be applied to other types of libraries. Several papers from *Special libraries: how to plan and equip them*, edited by Chester M. Lewis and published in 1963 (SLA Monograph no. 2), have been included where they are still pertinent. Preplanning techniques, space utilization, structural requirements, interior design, equipment and library moving procedure are covered. A checklist with guidelines for library planning, a bibliography, a list of equipment manufacturers and suppliers, and seven examples of library plans are provided.

PALMER, ARCHIE M., *ed.* Research Centers Directory. 4th edition. Detroit: Gale Research Co., 1972. 1033 pp. $47.50.

This new revised edition of the directory contains two unexpected changes, both in its index section: there is no personal name index and, more disappointing, no subject index.

The format of the main body of the directory has not changed, however. Within sixteen broad subject or functional sections (the same as those used in the previous edition) the entries for the research centres are listed alphabetically under their parent institution. Each entry includes name and address of the research unit, director's name, year founded, size and type of staff, principal fields of activity, and publications.

The two indexes provided are the Institutional Index—where research units are listed alphabetically under their sponsoring institution—and the Research Unit Index, which arranges all the research units in a single alphabetical sequence according to the name under which they operate.

To update this directory Gale publishes a quarterly periodical, *New Research Centers*, which contains information in the same format. It is published during the two years between editions of the Directory, and is available on separate subscription of $50.

This present volume is welcome because it provides detailed information not available elsewhere in one publication on some 5,500 research centres, which is over 1,000 entries larger than the previous edition. Its frustrating lack of a detailed subject index, however, means that its use as a tool for subject searching would involve a long, hard grind.

PITERNICK, ANNE B. Proceedings (of the Americal Society for Information Science, Western Canada Chapter) fourth annual meeting, Winnipeg, September 28 & 29, 1972. Vancouver: University of British Columbia, School of Librarianship, September 1972. 181 pp.

Papers are divided into five sections: (1) information systems, covering three operating in Canada, an international network for language information and UNISIST; (2) use studies and related topics, which comprises library use studies as sources of management information, citation counts, use of outside information services in a Canadian pharmaceutical research organization, and the sharing of social science research data by Canadian universities; (3) library automation, covering Canadian MARC at the National Library, design of a real-time circulation system, on-line automation of a UDC-based library, and a machine-readable holdings file at the University of Victoria; (4) technical and theoretical, which includes the TEXT-PAC system, the FAMULUS storage and retrieval system, and machine-readable subject authority lists and thesauri as aids in classification and concept analysis. A panel discussion on information transfer in Canada takes up the final section.

REGISTER OF MANAGEMENT CONSULTANTS AND ADVISORY SERVICES TO INDUSTRY. Epping (Essex): Gower Press (Director's Bookshelf), 1972. 388 pp. £6.00. (ISBN 0 7161 0125 4)

The first edition of this publication appeared in *Director's guide to management techniques*, but the coverage in the new edition has been extended to include accountancy firms with management consultancy departments and some individuals. Introductory chapters are designed to give a full background briefing on the selection and control of consultancy activities.

There are over one thousand entries in this volume, including about 750 consultancies and 250 advisory organizations. Membership of the Institute of Management Consultants is indicated. The directory is divided into three parts: register of consultants; register of advisory services to industry; indexes to the register of consultants.

The register of consultants includes tabular information on the location of the head office of the firm, and the number of regional offices, the number of consultants employed and the areas of expertise, e.g. personnel selection, distribution, licensing, etc. This information is reproduced also in the form of an alphabetical listing of consultants which shows in addition the full address, name of contact and a brief note about the areas of specialization of the consultant. Part one also has a section giving similar details for educational establishments offering consultancy.

Part two, the register of advisory services to industry, incorporates *Business efficiency—an ABC guide of advisory services* previously issued by NEDO. Associations, institutes and professional bodies are included in this section which gives the name and address of the organization, and a note of the services offered.

The indexes unfortunately cover only the consultants and educational establishments and not the advisory services. There are separate indexes by geograpical location, expertise classification, size and special industries. There is no single alphabetical index of the names of all the consultants and organizations included.

US SUPERINTENDENT OF DOCUMENTS. Decennial cumulative index 1941–1950 (to) United States Government publications monthly catalog. Index to the monthly issues from January 1941 to December 1950 and the Supplements for 1941–42, 1943–44 and 1945–46. Two vols. Detroit: Gale Research Co., 1971. 1848 pp. $48.00.

Those libraries holding the *United States Government Publications Monthly Catalog*, post 1940 will welcome The Gale Research Company's 1971 facsimile reprint of the *Decennial Cumulative Index, 1941–50* if they have not been able to obtain a copy of the original 1953 printing.

The two volume set indexes monthly issues of the catalog from January 1941 to December 1950 and the Supplements for 1941–42, 1943–44, and 1945–46, in one straight alphabetical sequence.

Index material from the monthly catalog is co-ordinated under subject headings established in 1953, so that titles and subject phrases which have changed over the ten year period are grouped together under the later heading. This is a subject guide and, therefore, authors of individual publications are omitted and publications are indexed under subject, rather than title catchword phrases. However, useful entries for bureaux, departments and agencies as authors of series are included.

'Micropublishers, reader and retrieval system manufacturers, microform users – in fact, almost everyone connected with the micrographic industry – will find a valuable and convenient reference source in this book.'

Micrographic Weekly

Miniaturised Communications

A review of microform

B. J. S. WILLIAMS

Published by

THE LIBRARY ASSOCIATION

in conjunction with

THE NATIONAL REPROGRAPHIC CENTRE FOR DOCUMENTATION

£1.50 (*£1.20 to L.A. members*)

FIRST for carpets

Dodson Bull

UP TO 30% DISCOUNT

BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display

In our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7871
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 66402
BRISTOL: 2-3 Royal London House, Queen Charlotte St BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LG.
Tel: Southend 46569
9.00-5.30 Mon-Fri, Sat 9.00-12.00 (Manchester 9.00-4.00)

Beat VAT by ordering this all important library reference tool now!

PALMER'S INDEX

to THE TIMES NEWSPAPER 1790-1941 (June)

NOW ON MICROFILM

We are pleased to announce a microfilm edition of this important work covering the full period of 151 years from 1790 to June, 1941, when publication ceased.

This essential work of reference to "The Times" newspaper covers a most important period of world history from the *French Revolution up to the Desert Campaign of the Second World War*, and the many important events both big and small in those 151 years. Indispensable to the bibliographer and in fact to everyone concerned with literally all aspects of humanity, this edition represents a tremendous achievement, covering the period it does fully.

The edition is produced on 35 mm. unperforated panchromatic safety film which, highly resistant to fire, can be stored safely in conditions suitable for paper records, and is produced to give the best results.

Advantageously priced, and therefore within the reach of every Library, we suggest that Libraries holding original sets consider the acquisition of a duplicate microfilm file to speed and assist in their work, while Libraries not yet having the file will find it of immense practical use.

"PALMER'S INDEX TO THE TIMES NEWSPAPER"

Complete Microfilm Edition 1790—1941 (June)

£282.50

In 21 reels covering the following periods, also available individually at the price indicated.

1790-1811	£44.00
1812-1831	£40.00
1832-1843	£24.00
1844-1853	£20.00
1854-1862	£18.00
1863-1868	£12.00
1869-1873	£10.00
1874-1878	£10.00
1879-1883	£10.00
1884-1888	£10.00
1889-1893	£10.00
1894-1899	£12.00
1900-1905	£12.00
1906-1910	£10.00
1911-1914	£ 8.00
1915-1919	£10.00
1920-1923	£ 8.00
1924-1927	£ 8.00
1928-1932	£10.00
1933-1937	£10.00
1938-1941, June	£ 7.00

Also available are some of the original quarterly volumes within the period 1867-1941 Details of these as well as a reprint edition of this work and both original and reprint edition of

"THE OFFICIAL INDEX TO THE TIMES"
"THE BRITISH MUSEUM SUBJECT INDEX"
"THE ENGLISH CATALOGUE OF BOOKS (CUMULATIVE VOLS.)"
"THE ANNUAL REGISTER"

and a host of other important reference aids

From:

H. PORDES

Publisher & Bookseller

529B, FINCHLEY ROAD, LONDON, NW3 7BH

NEW FOR 1973

SOCIAL SCIENCES CITATION INDEX™

A new reference tool for researchers, educators, and librarians in the social sciences.

Beginning in 1973 you'll find it a lot easier to search the social sciences journal literature if your library is one that has the new *SOCIAL SCIENCES CITATION INDEX.*

SSCI™ will utilize a retrieval technique based on the fact that some of the best indicators of the subject of an article are its reference citations to earlier publications. The technique is called *Citation Indexing* and *SSCI* will be the first reference tool to apply it to the literature of *all* the social sciences. So *SSCI* searches won't be hampered by ambiguous and rapidly changing terminology because *SSCI* won't use traditional subject headings.

And because *SSCI* will cover over 1,000 of the world's important journals from fields like anthropology, community health, demography, economics, educational research, ethnic group studies, geography, history, law, linguistics, management, marketing, political science, psychiatry, psychology, sociology, statistics, and urban planning and development, wide scattering of related articles won't result in incomplete searches.

Send in the coupon to find out more about why your library should have *SSCI.*

Please send me more information on your new *SOCIAL SCIENCES CITATION INDEX*™.

Name______________________________

Position______________________________

Library______________________________

Address______________________________

City____________State____________Zip________

13-336

Institute for Scientific Information
325 Chestnut Street, Philadelphia, Pa 19106, U S A.
Tel (215) 923-3300 Cable SCINFO, Telex 84-5305

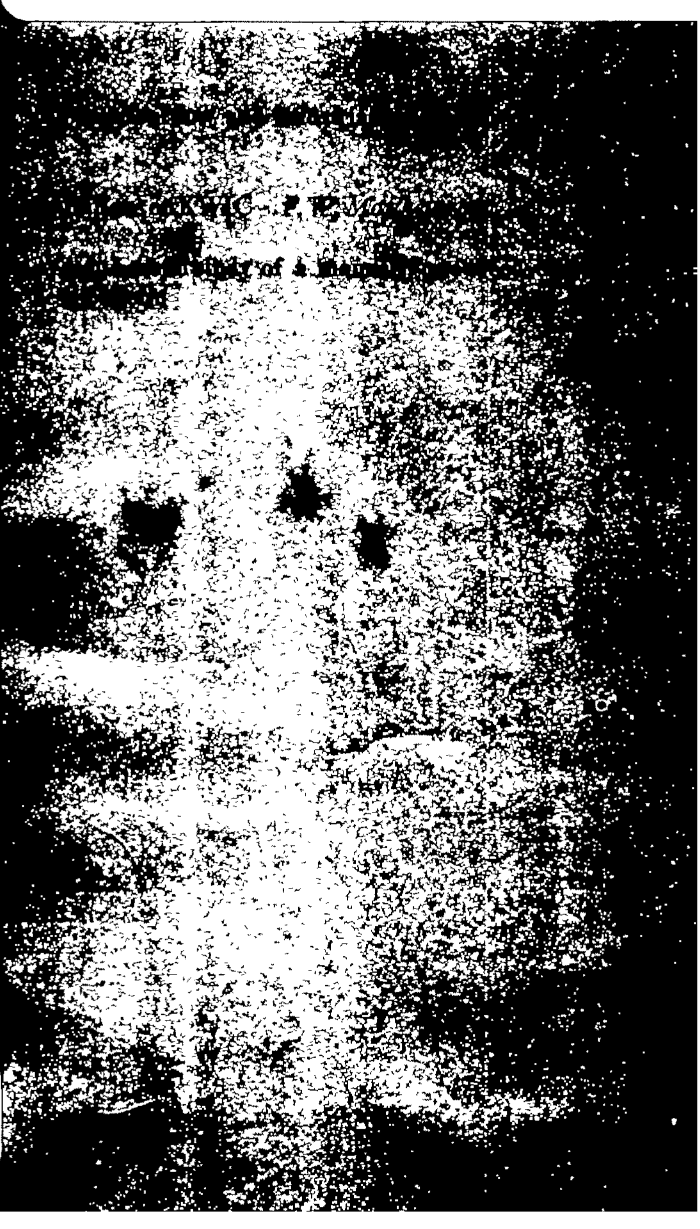
©1972 ISI

25 JUN 1973

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib

Proceeding



APRIL 1973
VOL. 25, NO. 4

AT LAST:

A social sciences reference tool that's easy to use, highly current, and multidisciplinary too!

Beginning in 1973 it will be a lot easier to search the social sciences journal literature if your library has the new *Social Sciences Citation Index*™ (*SSCI*™).

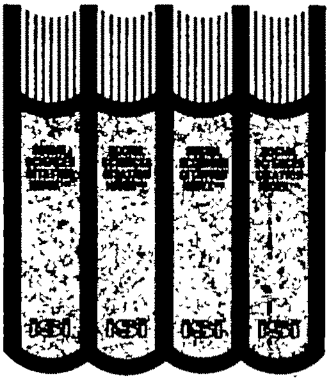
SSCI will offer an integrated search system designed to overcome the ambiguous terminology and wide scatter of related articles that used to make social science searches so difficult. It will take advantage of two powerful retrieval methods: Citation Indexing—which utilizes the fact that an article's reference citations to earlier publications are excellent indicators of the subject of the article, and Permuterm® Indexing—a natural language system that pairs every significant word in an article's title with every other word in that title to produce extremely specific, two-level indexing entries.

With *SSCI*, all you'll need to start a search on any subject is the name of a key author in the field of interest or any English word that is descriptive of the subject. There's no need to master specialized search vocabularies or complex classification schemes.

With *SSCI* you won't have to use a half-dozen discipline-oriented indexes to assure comprehensive searches. A single look-up lets you search the entire output of over 1,000 journals from all the fields relevant to the social sciences including anthropology, community health, demography, economics, educational research, ethnic group studies, geography, history, law, linguistics, management, marketing, political science, psychiatry, psychology, sociology, statistics, and urban planning and development.

And because *SSCI* will be computer-produced, it will be the most current index of its size. That means you'll find new articles while they're still new.

Send the coupon for more information.



13-336

Please send me more information on your new

SOCIAL SCIENCES CITATION INDEX™.

NAME______________________________

POSITION__________________________

LIBRARY___________________________

ADDRESS__________________________

CITY____________STATE__________ZIP______

isi® **Institute for Scientific Information**
325 Chestnut Street, Philadelphia, Pa. 19106, USA
Tel: (215) 923-3300 Cable: SCINFO, Telex. 84-5305

©1972 ISI

VERSIT

Aslib Proceedings

VOLUME 25 **APRIL 1973** **NUMBER 4**

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for Contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double-spaced, single-sided, on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

Information flow and industrial innovation

Andrew Robertson

Reader in Management Studies, The Polytechnic of Central London; former Senior Research Fellow, Science Policy Research Unit, University of Sussex, and leader of Project SAPPHO

Paper presented at an Aslib evening meeting, 10th January 1973

THE SAPPHO Project (Scientific Activity Predictor from Patterns with Heuristic Origins) was launched in 1968, with a grant from the Science Research Council, as a study of success and failure in industrial innovation. Two facts are worth emphasizing in introducing the project briefly. The first is that it had been noted by a number of researchers that, in introducing new products and processes to the market, there is a high failure rate. It varies from 60 to 90 per cent, depending on the sector of industry and the nature of the market. The second fact is allied to this. Innovations appear to happen in clusters, very seldom in isolation. Thus, when the world market for a particular chemical expands and forces up its price, several firms in the industry will encourage research into cost reducing or quantity increasing processes. Of this group of innovating firms, one or two will succeed commercially with a process, others will succeed technologically but not commercially, and some will fail on both counts.

The question then arises, why do some firms succeed outstandingly where others fail? By success, in this context, the SAPPHO research team meant dominant market share, plus profitability, crude but effective measures for investigating two out of a number of innovative attempts, if the pair contains the undoubted market leader and, as a contrast, the obvious failure or one of a number of such failures. By extracting from the copious literature (the basic bibliography compiled for the study consists of about five hundred references) the more popular hypotheses (size of firm, organization structure, project evaluation, R & D management, key individuals, marketing methods, etc.), a set of two hundred measures was constructed and arrayed in the form of a checklist of questions, not to be sent to the innovating firms but as a mnemonic to be used in interviews.

Interviews were 'open' or unstructured as well as governed by the checklist so that data could be captured which might have been missed if the checklist questions alone had been used. During this part of the interview, of course, a number of answers would appear that would satisfy some of the prepared questions. Ideally, at least three or more people were interviewed on each 'side' of a pair. In some cases, detailed case histories of innovations were built up, but in every case there resulted a file of information containing, at a rough estimate, 80–90 per cent of the necessary data for subsequent coding and analysis. It was recognized that, in a complex set of events such as a technological innovation, the various characteristics or measures would not all be independent. Indeed, most of them would be interdependent. Previous innovation literature has tended to look at single factor explanations, on the lines of the hypotheses already mentioned. What the SAPPHO team hoped to find was a group of characteristics that would effectively discriminate between a successful and a less successful or failed innovation, thus throwing additional light upon the necessary and sufficient conditions for commercial success, given technical success. To this end the various bits of information were coded +1 where one half rated higher than the other (e.g. was a larger firm, employed more scientists in R & D, spent more money on the innovation, etc.), 0 where the two were judged to be equal (e.g. appeared to have a similar type of external communication system) and −1 where one half was rated lower than the other. Thus, if the larger firm hypothesis were to be supported from the SAPPHO collection (in the end forty-three pairs or eighty-six cases were collected and analysed) then successful firms would have shown a majority of +1 codings as regards their size, however measured. To abbreviate the analytical description and come to the results, the variables which were found to show the greatest differences between successful and less successful innovations (in both industries—the two sectors were chemicals and scientific instruments) were as follows. Successful innovators:

—have a better understanding of user needs, sometimes by collaborating closely with potential customers;
—they do thorough market research or possess the necessary experience of user requirements (which is a leading characteristic of successful innovations);
—they pay more attention to marketing (failures were distinguished by neglect of market research, publicity, user education, and customer problems generally);
—their development work is more efficient, but not necessarily quicker than that of the failure cases;
—they remove technical snags from the product or process before they launch it, not after customer complaint;
—they usually have a larger development team on the project and therefore spend more money on it, even when the successful firm is smaller than the failure;
—they make more effective use of outside technological and scientific advice, even though they carry out most of the work in-house;
—they have better contacts with the outside scientific community in the specific area concerned and not merely in a general way.

The responsible individuals in the successful attempts are usually more senior and have greater authority than their counterparts who fail. In the instrument industry they have more diverse experience including experience abroad. The greater authority of the key individuals in the successful attempts is a factor in providing the scale of effort which is needed as well as the co-operation of R & D and marketing.

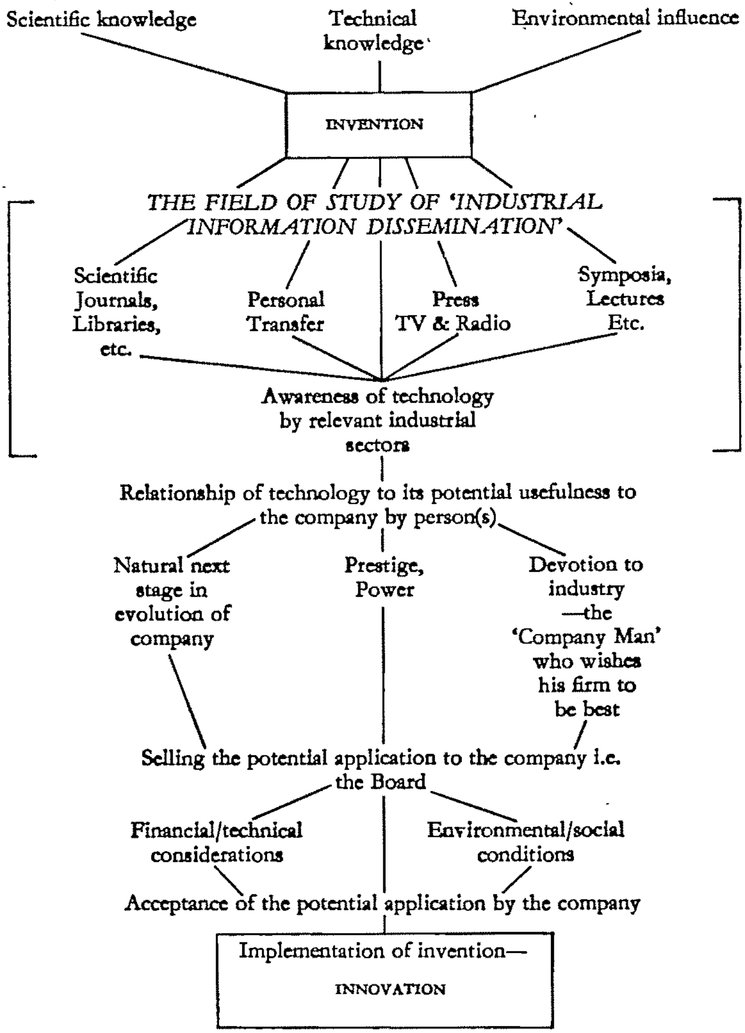

Scientific knowledge
Technical knowledge
Environmental influence
INVENTION
THE FIELD OF STUDY OF 'INDUSTRIAL INFORMATION DISSEMINATION'
Scientific Journals, Libraries, etc.
Personal Transfer
Press TV & Radio
Symposia, Lectures Etc.
Awareness of technology by relevant industrial sectors
Relationship of technology to its potential usefulness to the company by person(s)
Natural next stage in evolution of company
Prestige, Power
Devotion to industry —the 'Company Man' who wishes his firm to be best
Selling the potential application to the company i.e. the Board
Financial/technical considerations
Environmental/social conditions
Acceptance of the potential application by the company
Implementation of invention—
INNOVATION

FIG. 1: *A hypothetical model of Innovation*

Figure 1 (devised by Mr Anthony Grace of the PCL School of Management Studies) is a hypothetical model of the innovation process, seen, not from the angle of the SAPPHO project, but rather more from the point of view of the origin of ideas and information flow. If all-round communication by the innovating firm were under consideration it would be necessary to include in the model some conception of how the first of the above discriminating factors comes about—the manner in which firms come to understand potential users' needs. Market research, too, is a form of information flow as, indeed, is publicity for the innovation, which was often neglected by innovators. It is the seventh factor, however, on which this paper concentrates.

In a project such as SAPPHO, in which for the first time the whole of the innovation process came under scrutiny (from the idea or invention, through the process of R & D to production and eventually to the market, even if unsuccessfully), all the salient characteristics of the innovation process come under scrutiny, although not in depth. It should be added that the very nature of this kind of inquiry precludes any investigation of the behavioural type. The rather oversimplified checklist approach with its extremely bald reduction of the variables to what amounts to a binary notation (if the zeros are excluded) throws up only the descriptions of the variables without any interpretation, which has then to be undertaken subjectively. Figure 2 is a tabulation of four important studies of technologically progressive and innovative firms. Carter and Williams, who were investigating about two hundred firms in a wide range of industries, defined twenty-four characteristics of the 'technically progressive' firm (these may also be regarded as twenty-four conditions for successful industrial innovation, as it is a fair assumption that progressive firms in this definition will also be innovative). Their six characteristics dealing with information flow were: high quality incoming information; regular surveying of ideas; knowledge sharing with other firms, etc.; willingness to buy know-how and enter into joint ventures; an outward looking tendency; effective internal communication and co-ordination. The Queen's Award study placed first in its list of award winners' characteristics intra- and interfirm co-operation, which is similar in its message to several of the Carter and Williams' points. Burns and Stalker in *The Management of Innovation* (not included in the table) linked successful innovation with good communication. Marquis and Myers in *Successful Industrial Innovation* also emphasize the importance of information inputs and refer to the importance of personal contacts and experience.

In the SAPPHO results it emerged that, although most firms in the innovation game tend to have good contacts ('close coupling') with the scientific and technological community, the discriminating factor, a subdivision of this one, is that the successful innovators make use of this connection with specific reference to the innovation project itself. Not only do they have constant and high quality information flows, they pay special attention to those relevant to the project, and sometimes make use of technical assistance from outside at the production stage. The work of the MIT researchers, and particularly that of Professor T. J. Allen, has shown a correlation between successful innovative effort and systematic literature search and staff consultation (references will be found in the select bibliography). Allen and Cohen found that R & D teams with a poor innovative record spent more time than successful teams on initial data gathering, but neglected information seeking at later stages of a project, or at best fluctuated in their attention to information gathering during the life of the project. Teams with better results tended to be more consistent in the proportion of effort they put into data collection.

Allen also found, in another study, that high performance by teams tended to correlate with the use of internal sources of information. Comparatively poor performers not only tended to rely on outside sources but also to overrate the quality of those sources. Relevant literature was underused by the poorer performers, and where they did use the printed word it was frequently 'low grade', meaning that it was not academic nor professional but commercial, therefore outside the control of the professional institutes and 'open to the temptation of distortion towards the products of the heavy advertisers'.

There has been little or no specific research on innovations deriving from publications, but the literature contains numbers of anecdotes showing the part that has been played by journals in sparking off successful innovations or at least in problem solving during the innovation sequence. Outstanding examples that are well known include Whinfield's use of Carother's published work in the discovery of Terylene and the contribution to the cumene phenol process at Distillers Company (now BP Chemicals) by Quin from the publications of Hock and Lang on oxidation processes. Not yet published is another interesting case, that of Scientific Design's work on cyclohexane oxidation which made use of the work of Bashkirov, published in the Russian chemical literature. There must be many more examples of leads being picked up from the journals and it would be interesting to have more information of such events. Marquis and Myers have argued that personal experience and contacts are a principle source of information for successful innovations, and this has been supported by Langrish and his colleagues. Indeed the major sources of information inputs were ranked thus by Marquis and Myers, leaving aside education and experience: personal contacts were most important, providing 23 per cent of information; experiment and calculation came next (8 per cent); and printed materials next (7 per cent). Langrish's rating was as follows:

	Per cent
Persons joining the firm	21
Industrial experience	15
Education	9
Purchase and licensing of know-how	11
Literature (including patents)	10
Personal contact in the UK	9
Collaboration with suppliers	7
Collaboration with customers	5
Overseas visits	7
Obtained from Government organizations	6
Conferences	3
Consultancy	2

On this rating literature clearly scores respectably, and is obviously not a source that should be neglected. The SAPPHO research did not yield such a finding, mainly because of the nature of the data collection, but several good examples appear in the case histories. Solartron was attracted into the development of document readers by an article in the proceedings of the Institute of Electronics Engineers. The innovation of the atomic absorption spectrometer in the United States was initially triggered off by the papers of Alkemade and Milatz in the *Journal of the American Optical Society* and not by Walsh's work published in *Spectrochimica Acta,* although it was Walsh's instrument which was eventually put on the market by Perkin Elmer. In addition, as part of the innovation process in this case, Perkin Elmer gave birth to the *Atomic Absorption Newsletter*. The Danish milk analyser was based on a principle outlined in the *Journal of Dairy Science*. Enough has been said here to underline the importance to

FIG. 2: *Characteristics of technologically innovative firms*

SAPPHO EQUIVALENTS	CARTER & WILLIAMS	MARQUIS & MYERS	QUEEN'S AWARD
1–2 Successful innovators make more use of outside technology and scientific advice. They have better contacts with the scientific community, especially as regards their particular innovation.	1 Good information sources. 2 Seeking outside standards of performance.	1–4 Adopted innovations contribute significantly to commercial success. Ideas for innovations came from new information inputs. The main information inputs are general, widely diffused and easily accessible, (not in accordance with SAPPHO finding). Personal contacts and personal experience are best information sources for successful innovation.	1–5 Good co-operation. Inter- and intra-firm.
3 No equivalent. 4 Collaborate with potential customers.	3 Not secretive. 4 Readiness to co-operate.		
5 No equivalent.	5 Good co-ordination.	5 Innovation management is a corporate task, not R & D in isolation. Cannot be left to one functional department.	
6 No exact equivalent but see 1–2. 7 Successful innovators perform development work more efficiently and eliminate technical defects before launching an innovation.	6 Ideas surveyed. 7 Good consciousness in research.		
8 No equivalent. SAPPHO cases almost all exceeded estimated project costs.	8 Quantified investment decisions.		
9 No equivalent. Such techniques were used by successes and failures.	9 Good management techniques.		
10 Good contacts with scientists.	10 High status of science.		

FIG. 2: *Characteristics of technologically innovative firms* (continued)

SAPPHO EQUIVALENTS	CARTER & WILLIAMS	MARQUIS & MYERS	QUEEN'S AWARD
11 Not a characteristic that discriminated success from failure.	11 Scientists on the Board.		
12 Did not emerge as a success characteristic. May be a necessary condition of innovation attempts.	12 Good chief executive.		
13–14 No equivalents. Supply of QSE not a limiting factor in success or failure.	13 Attractive to talent.		
	14 Good recruitment policy.		
15 No equivalent.	15 Good training policy.		
16–18 No specific equivalents. The key manager was the business innovator responsible for the project.	16–17 Enough and good intermediate managers.		
	18 Managers stimulated.		
19 Marketing was the most important SAPPHO discriminator in terms of user needs understood, good market research, adequate publicity, user education and anticipation of user problems.	19 Effective selling.	19 Recognizing demand is more important than technical potential.	19 Clear dentification of a need. Realization of potential usefulness of a discovery.
20 Avoidance of technical after-sales problems by good development work. User education.	20 Good technical service.		
21 No equivalent. Shortage did not emerge as a factor in failure.	21 Ingenuity with shortages.		21 Availability of resources. Not equivalent but related.

Fig. 2: *Characteristics of technologically innovative firms* (continued)

SAPPHO EQUIVALENTS	CARTER & WILLIAMS	MARQUIS & MYERS	QUEEN'S AWARD
22 No equivalent. Most firms claimed to do some kind of 'forecasting'.	22 Forward-looking tendency.		
23 No equivalent. Growth rate of firms did not appear as a factor in success or failure.	23 High expansion rate.		
24 No equivalent.	24 Rapid machine replacement.		
Not listed by Carter & Williams		*Not listed by C. & W. or Sappho*	*Not listed by C. & W.*
1 Larger project teams.		1 Technical change is more usually by incremental rather than radical innovation.	
2 Business innovator as a key figure (the 'entrepreneur' in the innovating organization).			2 Top person (presence of an outstanding person in authority). Other person (some other type of outstanding individual).
			3 Help from government sources.

innovating organizations of keeping a constant watch on the information sources, of whatever kind, among them the high grade literature relevant to the firm's technology and to its particular innovation projects. Until some further research is done into the uses and abuses of internal and external information systems (data banks) it will not do to be dogmatic nor even conclusive, but there are enough clues strewn about the territory of innovation studies to make a searching look at the role of literature in the innovation process well worthwhile.

Acknowledgement

The author is grateful to Dr Roy Rothwell of the SAPPHO project at Sussex University for his help with the background to the research.

SELECT BIBLIOGRAPHY

ALLEN, T. J. *Problem solving strategies in parallel* R *&* D *projects.* Sloan School of Management Working Paper, 1965, 126–65.

—— *Sources of ideas and their effectiveness in parallel* R *&* D *projects.* Sloan School of Management Working Paper, 1965, 130–65.

—— *Time allocation among three technical information channels by* R *&* D *engineers.* Sloan School of Management Working Paper, 1966, 184–66.

—— *The utilization of information sources during* R *&* D *proposal preparations.* Sloan School of Management Working Paper, 1964, 97–64.

—— *and* COHEN, S. I. *Information flow in* R *&* D *laboratories.* Sloan School of Management Working Paper, 1968, 217–68.

—— *and* GERSTBERGER, P. G. *Criteria for selection of an information source.* Sloan School of Management Working Paper, 1967, p. 284–67.

—— Managing the flow of scientific and technical information. Ph.D. Thesis, MIT, 1966. Unpub.

BURNS, T. *and* STALKER, G. M. *The management of innovation.* Tavistock, 1961.

CARTER, C. F. *and* WILLIAMS, B. R. Characteristics of technically progressive firms. *Jnl. of Ind. Econ.*, March 1959.

LANGRISH, J. *et al. Industry and technical progress.* OUP, 1957.

MARQUIS, D. G. *and* MYERS, S. *Successful industrial innovation.* National Science Foundation, 1970.

—— *Wealth from knowledge.* Macmillan, 1971.

(referred to above as the Queen's Award study)

DISCUSSION

MR C. R. BATES (AEI Scientific Apparatus Ltd): 'Did the successful innovators acquire their characteristics by design or accident?'

MR ROBERTSON: 'Most firms would acquire their characteristics by design, that is, the management or Board would tend to decide the size of the enterprise, its resource allocation, product use, markets, etc. But such things as the presence of an appropriate key individual are sometimes "accidental" in the sense that no one really knows what an individual is capable of until he is tried.'

MR BATES: 'Did the SAPPHO enquiry take into account: (a) competitive forces; (b) general profitability of the company; (c) luck?'

MR ROBERTSON: 'The SAPPHO checklist did ask about "pressure", i.e. competitiveness. On profitability it asked only about growth rate over a period and this was coded to test whether S (successful innovator) grew faster than F (less successful innovator) during the innovation sequence. Luck is not measurable, but questions were designed to find whether the innovation was sought deliberately or whether it arose from serendipity.'

MR D. A. TOOKEY (Ashridge Management College) 'What is the role of marketing in innovation?'

MR ROBERTSON: 'There was a complete section of the checklist on marketing, and these factors showed the highest correlation with success.'

MR D. E. YEOMENS (IMI Ltd): 'What innovations now labelled "failures" in ten years time become successes?'

MR ROBERTSON: 'Yes, occasionally a first-time failure can come right by design or change of circumstances and become a success. We allowed for this by keeping the parallel sequences confined to the period in which S had the market leadership, while F was out of the running. Anyway, we excluded second generation innovators, and mostly that is how instrument success arises from early failures, by radical redesign and relaunch.'

MR P. DANSEY (INSPEC): 'In cases where the invention was made external to the innovating firm, was the initial approach made by the inventor or was the invention discovered through the literature and other sources?'

MR ROBERTSON: 'Both. With innovations handled by NRDC the approach is made to the company, and this pattern is fairly constant where patents and licenses are involved, but of our first collection of fifty-eight cases, probably no more than 10 per cent were picked up from the literature and similar sources, although important improvements were frequently found thus.'

MR G. P. STOW (Plessey Co Ltd): 'Could you please comment on the effects of geographical isolation of research laboratories from production departments, etc., on the innovation process.'

MR ROBERTSON: 'We searched systematically for some significant effects of geographically scattered R & D, having noted the findings of Professor T. J. Allen at MIT, but the "sample" was too small to show a strong correlation. Nevertheless, in the case histories there is clear evidence that wide separation between, say, inventor and innovator, or research and development, can be a barrier to successful innovation unless deliberate and careful provision is made to overcome communication problems.'

MR K. C. BHATTACHARYA (NRLSI): 'Has project SAPPHO or any other innovation studies established quantitatively the relative importance of the library information centre in the process of efficient communication?'

MR ROBERTSON: 'No, because this would have demanded a separate type of study or a different method. We did not ask directly about information centres but rather about the "coupling" of the firm with the scientific and technological community. The factor which emerged was that S firms have closer coupling than F firms. This question would be an interesting research project in itself.'

Variations on KWIC

F. W. Matthews and A. D. Shillingford*

Central Technical Information Unit,
ICI Ltd

Paper presented at an Aslib evening meeting, 9th February 1972

Introduction

KWIC—Key Word In Context—is a form of automatic indexing using computers. It is automatic in the sense that the computer system determines the indexing from free text input. Luhn[1] first described the method in which text of a length which can be accommodated on a single line of print is indexed at the centre of the page, the words that precede and follow the indexing keyword being displayed on the same line. As a control device a list of words for which no indexing entry should be made is stored in the computer program. This list, often referred to as a 'stop list', includes the articles, conjunctions and commonly occurring trivial words which do not form useful indexing entries. Less frequently occurring 'useless' entries are carried, but at little cost and with little damage to the usefulness of the index. The system is often referred to as quick and dirty: quick in that it is cheap to run, easy to prepare and not demanding of intellectual decisions at input; dirty in that useless entries will appear in the index, and, since the indexing vocabulary is uncontrolled, the user must consider alternative words that may express the concept for which he is searching. When the input is prepared in-house a number of control features can be used to supplement the stop list to make the index more effective but requiring more thought at input. This paper concerns a number of such added control features.

A comprehensive review of uses of KWIC is given by Fisher.[2] The first published KWIC index was *Chemical Titles*,[3] which lists the titles of articles in several hundred of the world's chemical journals, often simultaneous with or before publication of the journal itself. KWIC is widely used for indexing in industrial organizations, (e.g. Bell Telephone, Standard Oil of New Jersey, and Imperial Chemical Industries) and is appearing in some books in edited form, replacing the traditional subject index presentation. A good example appears in a book on systems analysis by Chandor.[4]

Control of KWIC entries

In the programs to be described, three control methods in addition to the stop list have been applied, allowing the entries which will appear in the index to be fully controlled. These control methods are:

(1) stringing

---

* Dr F. W. Matthews is now at the Dalhousie University School of Library Service, Halifax, Nova Scotia.

(2) 20-character rule
(3) the double period

The KWIC program makes an indexing entry for each 'word' of input that is not on the stop list. To the computer a 'word' is a string of alphabetic, numeric, punctuation or special characters between two blanks. If words are joined by any character—including a non-printing character—only the first word of the string is indexed and no entry occurs for the others. Thus by adding, for example, hyphens where they would not normally occur, some control of the indexing is possible. The added hyphens disturb the readability of the text, and for this reason the possibility of omitting them from the printed index (while retaining their linking significance) or of using some character which will not be printed by the computer being used, is under discussion. This stringing character has the effect of creating a longer word but will not show in the printed line. The former method has the advantage that the stringing character can be printed in an edit run of the data to facilitate checking, but is omitted when printing an index.

An extension of this method is given by the '20-character rule'. The KWIC program includes the requirement that indexing records are made only if the 'word' has less than twenty-one characters. Words which are useful but have no indexing value may thus be combined into phrases and prevented from indexing by the insertion of stringing characters to form a single 'word' more than twenty characters in length.

The 'twenty character' rule is not always applicable without losing a useful entry. In some such cases the double-period control feature may be used. This states that any word ending in two periods will not be indexed. The double period affects the readability of the line and could be replaced by a special character which in the computer could be made to have the same effect, i.e. of nominating a temporary 'stopword'.

Stylizers

The KWIC index may include a type of information which is repeated frequently in the input, e.g. personal authors, corporate authors, dates, journal references. It is often useful to separate these from the 'words' index and display them separately. This can be done if a special character is entered before each author, date, etc. There are about twelve such characters available on most computer systems. These will include punctuation marks and a variety of symbols such as £, @, %. The sorting sequence of these, which determines the order in which they will appear in the index, is fixed by the computer system and may be a factor in the choice of the stylizers. A typical set of stylizers is as follows:

/	personal authors
+	corporate names
@	dates
.	journal reference
*	trade names

Obviously no character should be used as a stylizer if it may occur at the beginning of any word in the text.

Figures 1A and 1B show an example where the control features described, and stylizers, have been used.

Multifile KWIC

KWIC, in its simplest form, can be run from a file of punched cards maintained manually for additions and corrections. This card file soon becomes awkward as the size of the file or the number of separate files increases. Hence, there is good reason to store the file on magnetic tape. The cards then become only a means of entry to the file for additions or maintenance. A system that provides for many such files may be described as a 'multifile' where more than one index is maintained as a single computer file stored either on tape or on disk. The individual indexes may be identified by a 'tag' such as the first two characters of the identification or accession number which is assigned to each item in a file. A KWIC index may be run from any one, or any combination, of the files on the multifile. Files may be maintained by additions, deletions and/or corrections to existing individual items in individual files. Accumulation on a current or long-term basis is possible; for instance, weekly additions to a file may be accumulated for three months, at which time this quarterly accumulation is added to a cumulative file of previous quarters and a single cumulative index produced. Similarly, annual or longer-term indexes may be printed for any single file or combination of files. Operating in this way it becomes possible, and at the same time economically attractive, to run indexes for, say, individual members of a research team, providing 'personal' indexes and, if required, a master cumulative index for all members of the team. Such indexes may prove more effective and cheaper to maintain than the traditional 5″ × 3″ card index maintained by the individual: more effective because indexing by several keywords, authors, etc. is obtained from a single entry, and cheaper because little of the research worker's time is required for the creation and maintenance of the index. The information is at the same time captured and preserved for use by a wider group to whom it may be useful.

Instant file

Normally the decision to use a computer for indexing purposes will involve systems controllers, systems analysts, and programmers, thus becoming a major undertaking involving people outside the user's department. If, however, the indexing is of a type that can be handled on a multifile KWIC the use of the computer requires no new systems analysis, or programming, and thus involves no one outside the unit. Before opening a file it is necessary only to ensure that the 'tag' chosen to identify the file is unique to the system. The choice of two characters allows for many files, so this is not a major restriction. This concept of an 'Instant file' is most appropriate for minor and short-term applications which would not be worthwhile if time were spent in initiating a new computer system. It is particularly useful in indexing literature surveys, personal files of journal references or reprints, and short-term laboratory data compilations.

The sort field that determines the order of presentation of the items in the KWIC index extends to the right of the 'keyword' in the centre of the page. This sort field may vary from twenty to sixty characters, thus providing a form of secondary ordering. This added order should be taken into consideration in deciding the format or order within the input line, particularly where stylized entries are concerned. For example, in a marketing file, if each item were arranged in the order—Geographic Code, followed by Customer Name, followed by Product Name, then all customers within a geographic code would be listed in alphabetic order, and for a given customer all products would be listed alphabetically. The same considerations of format apply where the indexing line is shifted to the left-hand side of the page.

Columnar KWIC

The KWIC technique was originally applied to the indexing of essentially textual items, particularly titles of books or journal articles. In certain applications, it became apparent that most of the items included a number of fixed-length elements (e.g. date, coded journal reference, patent number). In such cases it was frequently found useful to assign fixed positions in the 120-character KWIC line to the fixed-length elements, so that, for instance, a patent number would always be entered in columns 8–14 of the input card, and a date in columns 16–21. The remainder of the KWIC line would be used for 'free-form' text. This format came to be known as 'columnar KWIC', because of the tabulated appearance of the accession list to the index. Figure 1A—a part-columnar KWIC of departmental correspondence—exemplifies the approach.

The columnar record can be used to provide an index to items consisting of fixed-length alphabetic or numeric data elements with little or no textual content. The index itself provides several reference points from a single input line, ordered for look-up or comparison. Figure 2A shows an index which was developed as a tool for a market-research application. The salient details of each transaction are expressed, always in the same order (viz. the customer's name, then his location, an appropriate Standard Industrial Classification code, the product group and specific product concerned—and so on). Each customer/product transaction—each sale—generates a line of input.

The resulting index (Figure 2B) gives, at low cost, a detailed picture of customer and competitive activity, and the seller's market penetration ('our share'). Another version of the same index with the indexing line at the left is given as Figure 2C. The structure of the columnar KWIC record makes it possible to use a Report Generator program—in this case, the Mark IV File Management System[5]—to present a summary of the information in tabular form, with column headings, totals, averages, etc. An example of a management summary, extracted by Mark IV from the data shown in Figure 2A, is shown as Figure 3.

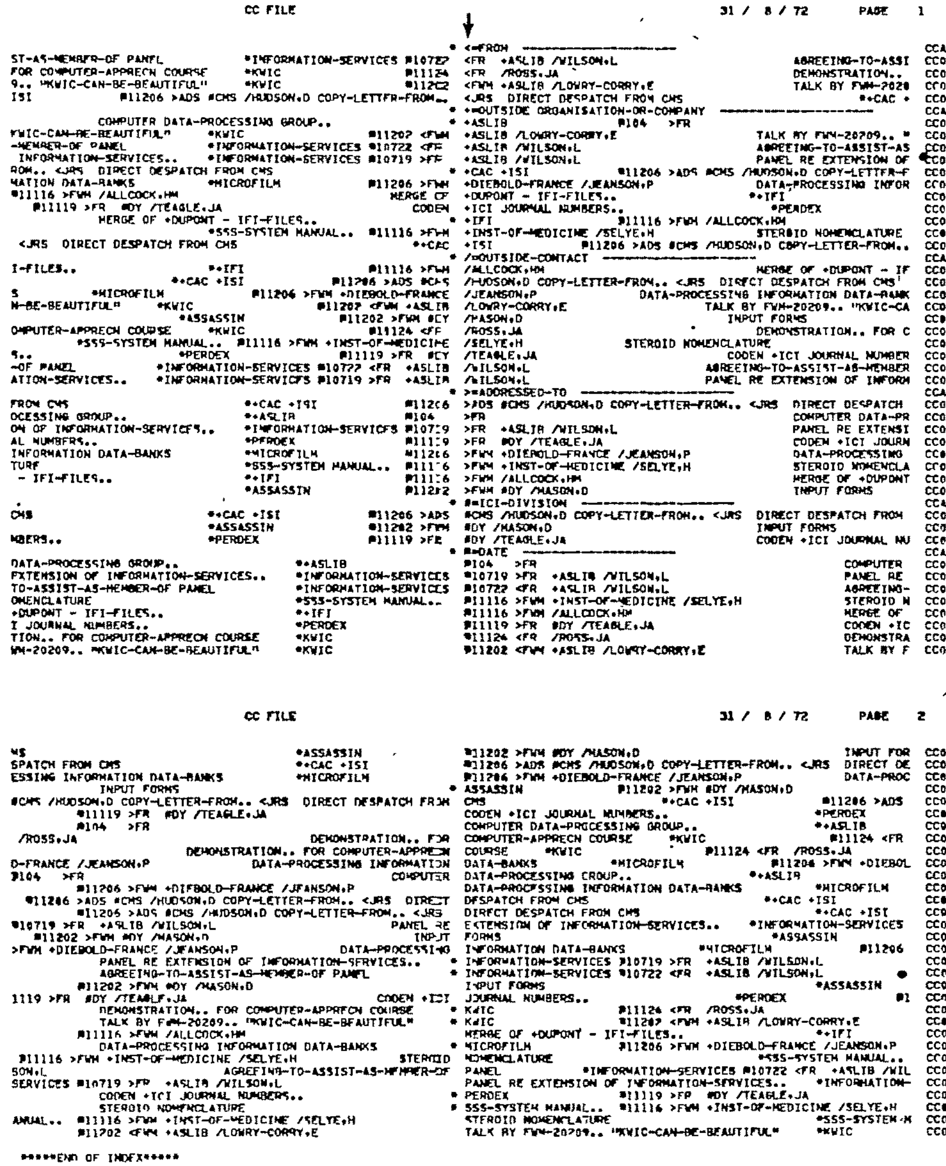
The principle of coding used in the 'Market-research' KWIC can be extended considerably to increase the number of indexable data elements. Highly-coded formats are particularly appropriate in the indexing of laboratory or test data. Figure 4 shows an index to experimental polymer batch reaction data, where each line of input comprises a total of sixteen indexable data elements. The cost of this index, which refers back via the accession number to a set of laboratory notebooks, is of the order of 0.2p per index entry for computer charges.

```
                                      ACCESSION LIST FOR KWIC INDEX.                          31 / 8 / 72      PAGE  1

CC AAAA     >=ADDRESSED-TO ------------------
CC AAAB     <=FROM ------------------
CC AAAC     /=OUTSIDE-CONTACT ------------------
CC AAAD     +=OUTSIDE ORGANISATION-OR-COMPANY ------------------
CC AAAE     *=DATE ------------------
CC AAAF     #=ICI-DIVISION ------------------
CC 0511     INFORMATION-SERVICES *10719 >FR  +ASLIB /WILSON,L                       PANEL RE EXTENSION OF INFORMATION-SERVICE
CC 0517     INFORMATION-SERVICES *10722 <FR  +ASLIB /WILSON,L                       AGREEING-TO-ASSIST-AS-MEMBER-OF PANEL
CC 0711     SSS-SYSTEM MANUAL..  *11116 >FWM +INST-OF-MEDICINE /SELYE,H             STEROID NOMENCLATURE
CC 0766     +IFI                 *11116 >FWM /ALLCOCK,HM                            MERGE OF +DUPONT - IFI-FILES..
CC 0768     PERDEX               *11119 >FR  #DY /TEAGLE,JA                         CODEN +ICI JOURNAL NUMBERS..
CC 0780     KWIC                 *11124 <FR  /ROSS,JA                               DEMONSTRATION.. FOR COMPUTER-APPRECN COUR
CC 0799     ASSASSIN             *11202 >FWM #DY /MASON,D                           INPUT FORMS
CC 0802     KWIC                 *11202 <FWM +ASLIB /LOWRY-CORRY,E                  TALK BY FWM-20209.. "KWIC-CAN-BE-BEAUTIFU
CC 0810     +CAC +ISI            *11206 >ADS #CHS /HUDSON,D COPY-LETTER-FROM.. <JRS DIRECT DESPATCH FROM CHS
CC 0815     +ASLIB               *104   >FR                                         COMPUTER DATA-PROCESSING GROUP..
CC 0823     MICROFILM            *11206 >FWM +DIEBOLD-FRANCE /JEANSON,P             DATA-PROCESSING INFORMATION DATA-BANKS
```

FIG. 1A: *Accession List showing input to a KWIC Index to correspondence. The format is partly columnar*

```
<                       INTRODUCTION            WORK
(                       INVOLVING               1
&                       IS                      2
*                       IT                      3
)                       ITS                     4
-                       LIMITED                 5
>                       LTD                     6
'                       MAJOR
A                       NEW
AN                      OBTAINED
AND                     OF
ANY                     ON
ARE                     ONE
AS                      OR
AT                      OTHER
BE                      OUR
BEING                   PLANTS
BETWEEN                 PREPARATION
BUT                     PRESENCE
BY                      PRINCIPLES
CALCULATIONS            PROBLEMS
CO.                     PROCESS
COMPANY                 PRODUCED
COMPOSITION             PRODUCTION
COMPOSITIONS            PRODUCTS
COMPOUNDS               RE
COMPRISED               REACTING
CONSISTING              REACTIONS
CONTAINING              RELATING
CONVERSION              REPORTS
CORP                    SCHEMES
CORPORATION             SECOND
CORPORATIONS            SITUATION
DERIVATIVES             SIX
EFFECT                  STUDIES
EFFECTS                 STUDY
EXPERIMENTAL            SYNTHESIS
FACTORS                 TECHNOLOGY
FIRST                   THAN
FIVE                    THE
FOR                     THREE
FOUR                    TO
FROM                    TREATMENT
GENERAL                 TRIAL
GIVE                    TWO
HAS                     USE
HAVE                    USED
IF                      USING
IN                      WILL
INTERIM                 WITH
```

Example of a stop-list used in the Multi-file KWIC system.



```
                                CC FILE                                                 31 /  8 / 72        PAGE    1
                                                                 ↓
                                                               * <=FROM ---------------------                                    CCAAAB
ST-AS-MEMBER-OF PANEL        *INFORMATION-SERVICES #10722  <FR  +ASLIB /WILSON.L                          AGREEING-TO-ASSI  CC0517
FOR COMPUTER-APPRECN COURSE   *KWIC                      #11124  <FR  /ROSS.JA                                  DEMONSTRATION..   CC0780
9.. "KWIC-CAN-BE-BEAUTIFUL"   *KWIC                      #11202  <FWM +ASLIB /LOWRY-CORRY.E                     TALK BY FWM-2020  CC0802
ISI          #11206 >ADS #CMS /HUDSON.D COPY-LETTER-FROM..  <JRS  DIRECT DESPATCH FROM CMS                       *+CAC +  CC0810
                                                               * +=OUTSIDE ORGANISATION-OR-COMPANY ------------------   CCAAAD
          COMPUTER DATA-PROCESSING GROUP..                     * +ASLIB                 #104   >FR                             CC0815
KWIC-CAN-BE-BEAUTIFUL"    *KWIC                     #11202 <FWM  +ASLIB /LOWRY-CORRY.E                 TALK BY FWM-20209.. "  CC0802
-MEMBER-OF PANEL          *INFORMATION-SERVICES #10722 <FR   +ASLIB /WILSON.L                      AGREEING-TO-ASSIST-AS  CC0517
 INFORMATION-SERVICES..   *INFORMATION-SERVICES #10719 >FR   +ASLIB /WILSON.L                      PANEL RE EXTENSION OF  CC0511
ROM.. <JRS  DIRECT DESPATCH FROM CMS                         * +CAC +ISI          #11206 >ADS #CMS /HUDSON.D COPY-LETTER-F  CC0810
MATION DATA-BANKS         *MICROFILM                #11206 >FWM  +DIEBOLD-FRANCE /JEANSON.P            DATA-PROCESSING INFOR  CC0823
#11116 >FWM /ALLCOCK.HM                                 MERGE OF  +DUPONT - IFI-FILES..                    *+IFI              CC0766
   #11119 >FR  #DY /TEAGLE.JA                              CODEN  +ICI JOURNAL NUMBERS..                       *PERDEX        CC0768
          MERGE OF +DUPONT - IFI-FILES..                     * +IFI                #11116 >FWM /ALLCOCK.HM                     CC0766
                          *SSS-SYSTEM MANUAL..  #11116 >FWM  +INST-OF-MEDICINE /SELYE.H             STEROID NOMENCLATURE  CC0711
 <JRS  DIRECT DESPATCH FROM CMS                            *+CAC  +ISI          #11206 >ADS #CMS /HUDSON.D COPY-LETTER-FROM..  CC0810
                                                               * /=OUTSIDE-CONTACT ----------------------                       CCAAAC
I-FILES..                 *+IFI                     #11116 >FWM  /ALLCOCK.HM                            MERGE OF +DUPONT - IF  CC0766
                    *+CAC +ISI              #11206 >ADS #CMS  /HUDSON.D COPY-LETTER-FROM.. <JRS  DIRECT DESPATCH FROM CMS  CC0810
S          *MICROFILM              #11206 >FWM +DIEBOLD-FRANCE  /JEANSON.P              DATA-PROCESSING INFORMATION DATA-BANK  CC0823
N-BE-BEAUTIFUL"     *KWIC                   #11202 <FWM +ASLIB  /LOWRY-CORRY.E                      TALK BY FWM-20209.. "KWIC-CA  CC0802
                    *ASSASSIN                  #11202 >FWM #DY  /MASON.D                                  INPUT FORMS          CC0799
OMPUTER-APPRECN COURSE    *KWIC                   #11124 <FR   /ROSS.JA                                DEMONSTRATION.. FOR C  CC0780
        *SSS-SYSTEM MANUAL..  #11116 >FWM +INST-OF-MEDICINE  /SELYE.H             STEROID NOMENCLATURE                       CC0711
S..                 *PERDEX                    #11119 >FR  #DY  /TEAGLE.JA                          CODEN +ICI JOURNAL NUMBER  CC0768
-OF PANEL           *INFORMATION-SERVICES #10722 <FR   +ASLIB  /WILSON.L                        AGREEING-TO-ASSIST-AS-MEMBER  CC0517
ATION-SERVICES..    *INFORMATION-SERVICES #10719 >FR   +ASLIB  /WILSON.L                        PANEL RE EXTENSION OF INFORM  CC0511
                                                               * >=ADDRESSED-TO ----------------------                          CCAAAA
FROM CMS                          *+CAC +ISI                #11206 >ADS #CMS /HUDSON.D COPY-LETTER-FROM.. <JRS  DIRECT DESPATCH  CC0810
OCESSING GROUP..                  *+ASLIB                   #104   >FR                                      COMPUTER DATA-PR  CC0815
ON OF INFORMATION-SERVICES..      *INFORMATION-SERVICES #10719 >FR  +ASLIB /WILSON.L                        PANEL RE EXTENSI  CC0511
AL NUMBERS..                      *PERDEX                   #11119 >FR  #DY /TEAGLE.JA                      CODEN +ICI JOURN  CC0768
INFORMATION DATA-BANKS            *MICROFILM                #11206 >FWM +DIEBOLD-FRANCE /JEANSON.P          DATA-PROCESSING   CC0823
TURE                              *SSS-SYSTEM MANUAL..      #11116 >FWM +INST-OF-MEDICINE /SELYE.H          STEROID NOMENCLA  CC0711
 - IFI-FILES..                    *+IFI                     #11116 >FWM /ALLCOCK.HM                         MERGE OF +DUPONT  CC0766
                                  *ASSASSIN                 #11202 >FWM #DY /MASON.D                        INPUT FORMS       CC0799
                                                               * #=ICI-DIVISION ----------------------                          CCAAAF
CMS                          *+CAC +ISI             #11206 >ADS  #CMS /HUDSON.D COPY-LETTER-FROM.. <JRS  DIRECT DESPATCH FROM  CC0810
                             *ASSASSIN              #11202 >FWM  #DY /MASON.D                            INPUT FORMS            CC0799
MBERS..                      *PERDEX                #11119 >FR   #DY /TEAGLE.JA                          CODEN +ICI JOURNAL NU  CC0768
                                                               * #=DATE ----------------------                                  CCAAAE
DATA-PROCESSING GROUP..                *+ASLIB                 #104   >FR                                        COMPUTER     CC0815
EXTENSION OF INFORMATION-SERVICES..    *INFORMATION-SERVICES   #10719 >FR  +ASLIB /WILSON.L                      PANEL RE     CC0511
TO-ASSIST-AS-MEMBER-OF PANEL           *INFORMATION-SERVICES   #10722 <FR  +ASLIB /WILSON.L                      AGREEING-    CC0517
OMENCLATURE                            *SSS-SYSTEM MANUAL..    #11116 >FWM +INST-OF-MEDICINE /SELYE.H            STEROID N    CC0711
+DUPONT - IFI-FILES..                  *+IFI                   #11116 >FWM /ALLCOCK.HM                           MERGE OF     CC0766
I JOURNAL NUMBERS..                    *PERDEX                 #11119 >FR  #DY /TEAGLE.JA                        CODEN +IC    CC0768
TION.. FOR COMPUTER-APPRECN COURSE     *KWIC                   #11124 <FR  /ROSS.JA                              DEMONSTRA    CC0780
WM-20209.. "KWIC-CAN-BE-BEAUTIFUL"     *KWIC                   #11202 <FWM +ASLIB /LOWRY-CORRY.E                 TALK BY F    CC0802


                                CC FILE                                                 31 /  8 / 72        PAGE    2

MS                                     *ASSASSIN               #11202 >FWM #DY /MASON.D                          INPUT FOR   CC0799
SPATCH FROM CMS                        *+CAC +ISI              #11206 >ADS #CMS /HUDSON.D COPY-LETTER-FROM.. <JRS  DIRECT DE  CC0810
ESSING INFORMATION DATA-BANKS          *MICROFILM              #11206 >FWM +DIEBOLD-FRANCE /JEANSON.P             DATA-PROC  CC0823
            INPUT FORMS                                      * ASSASSIN             #11202 >FWM #DY /MASON.D                  CC0799
#CMS /HUDSON.D COPY-LETTER-FROM.. <JRS  DIRECT DESPATCH FROM   CMS                   *+CAC +ISI                  #11206 >ADS  CC0810
        #11119 >FR  #DY /TEAGLE.JA                             CODEN +ICI JOURNAL NUMBERS..                         *PERDEX   CC0768
        #104   >FR                                             COMPUTER DATA-PROCESSING GROUP..                     *+ASLIB   CC0815
 /ROSS.JA                             DEMONSTRATION.. FOR      COMPUTER-APPRECN COURSE     *KWIC                 #11124 <FR   CC0780
                    DEMONSTRATION.. FOR COMPUTER-APPRECN       COURSE     *KWIC              #11124 <FR  /ROSS.JA             CC0780
D-FRANCE /JEANSON.P             DATA-PROCESSING INFORMATION    DATA-BANKS         *MICROFILM           #11206 >FWM +DIEBOL  CC0823
#104   >FR                                        COMPUTER     DATA-PROCESSING GROUP..                 *+ASLIB                CC0815
        #11206 >FWM +DIEBOLD-FRANCE /JEANSON.P                 DATA-PROCESSING INFORMATION DATA-BANKS          *MICROFILM     CC0823
  #11206 >ADS #CMS /HUDSON.D COPY-LETTER-FROM.. <JRS  DIRECT   DESPATCH FROM CMS                         *+CAC +ISI           CC0810
        #11206 >ADS #CMS /HUDSON.D COPY-LETTER-FROM.. <JRS     DIRECT DESPATCH FROM CMS                      *+CAC +ISI       CC0810
#10719 >FR  +ASLIB /WILSON.L                        PANEL RE   EXTENSION OF INFORMATION-SERVICES..   *INFORMATION-SERVICES    CC0511
   #11202 >FWM #DY /MASON.D                            INPUT   FORMS                                       *ASSASSIN          CC0799
>FWM +DIEBOLD-FRANCE /JEANSON.P               DATA-PROCESSING  INFORMATION DATA-BANKS        *MICROFILM           #11206      CC0823
            PANEL RE EXTENSION OF INFORMATION-SERVICES..     * INFORMATION-SERVICES #10719 >FR  +ASLIB /WILSON.L              CC0511
            AGREEING-TO-ASSIST-AS-MEMBER-OF PANEL            * INFORMATION-SERVICES #10722 <FR  +ASLIB /WILSON.L              CC0517
        #11202 >FWM #DY /MASON.D                               INPUT FORMS                                     *ASSASSIN      CC0799
1119 >FR  #DY /TEAGLE.JA                         CODEN +ICI    JOURNAL NUMBERS..                    *PERDEX              #1   CC0768
            DEMONSTRATION.. FOR COMPUTER-APPRECN COURSE      * KWIC              #11124 <FR  /ROSS.JA                         CC0780
            TALK BY FWM-20209.. "KWIC-CAN-BE-BEAUTIFUL"      * KWIC              #11202 <FWM +ASLIB /LOWRY-CORRY.E            CC0802
        #11116 >FWM /ALLCOCK.HM                                MERGE OF +DUPONT - IFI-FILES..                  *+IFI          CC0766
            DATA-PROCESSING INFORMATION DATA-BANKS           * MICROFILM         #11206 >FWM +DIEBOLD-FRANCE /JEANSON.P       CC0823
 #11116 >FWM +INST-OF-MEDICINE /SELYE.H               STEROID  NOMENCLATURE                        *SSS-SYSTEM MANUAL..       CC0711
SON.L                         AGREEING-TO-ASSIST-AS-MEMBER-OF  PANEL        *INFORMATION-SERVICES #10722 <FR  +ASLIB /WIL     CC0517
SERVICES #10719 >FR  +ASLIB /WILSON.L                          PANEL RE EXTENSION OF INFORMATION-SERVICES..   *INFORMATION-   CC0511
            CODEN +ICI JOURNAL NUMBERS..                     * PERDEX            #11119 >FR  #DY /TEAGLE.JA                   CC0768
            STEROID NOMENCLATURE                             * SSS-SYSTEM MANUAL..  #11116 >FWM +INST-OF-MEDICINE /SELYE.H    CC0711
ANUAL..  #11116 >FWM +INST-OF-MEDICINE /SELYE.H                STEROID NOMENCLATURE                          *SSS-SYSTEM-M    CC0711
        #11202 <FWM +ASLIB /LOWRY-CORRY.E                      TALK BY FWM-20209.. "KWIC-CAN-BE-BEAUTIFUL"   *KWIC            CC0802

 *****END OF INDEX*****
```

FIG. 1B: *Complete KWIC Index produced from the input shown in Fig. 1A. The effects of the stop-list, stringing, the 20-character rule, and the double period, are all illustrated*

```
                          ACCESSION LIST FOR KWIC INDEX.                          8 / 9 / 72 - PAGE  1

MX AAAA    .=CUSTOMER  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MX AAAB    ..=SIC  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MX AAAC    +=COMPETITOR  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MX AAAD    £=PURCHASES-PA   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MX AAAE    %=OUR-SHARE   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MX AAAF    #=PRODUCT-CLASS   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MX AAAG    #-=PRODUCT   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MX AAAH    -=LOCATION   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MX AAAI    =CODE-WHY-NOT-100%   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
MX 0001    .DERBY-&-CO            -MLD ..821/3 #HARDW #-REFRIGERATORS £030000 %03 SS +FLOORS.INC  SPECIAL-SALES-TBT-JAN/FEB
MX 0002    .ROBERTS-LTD           -MLD ..821/3 #HARDW #-TOOLS         £001000 %97    +T.R.Z.-LTD  PRESSURE-FROM-JONES-&-CO
MX 0003    .HARRISON-&-GEORGE     -NW  ..821/3 #FURNG #-CARPETS       £010000 %11 QU +JONES-&-CO  5%-REBATE-OFFERED..
MX 0004    .STEVENSON-LTD         -MLD ..820/2 #FOODS #-MEAT          £015000 %05 PR +FOODS-LTD   SPECIAL-SALES-TBT-JAN/FEB
MX 0005    .JACKSON.DOUGLAS       -LDN ..820/2 #FOODS #-CANNED        £120000 %85 PR +SMITH.Z-LTD
MX 0006    .SMITH-&-BLACK         -LDN ..820/2 #FOODS #-FRUIT         £025000 %79 SS +COVGAR-GENL  15%-DISCOUNT-OFFER-CLOSES-FEB
MX 0007    .JACKSON.DOUGLAS       -LDN ..821/3 #FURNG #-FLOOR-TILES   £045000 %71 RE +JONES-&-CO
MX 0008    .GRUBB-BROS            -LDN ..820/2 #FOODS #-FRUIT         £090000 %25 PR +FOODS-LTD
MX 0009    .THOMLINSON-&-BROWN    -NW  ..812/4 #FURNG #-CARPETS       £105000 %75 CA +JONES-&-CO BUYING-DEPT-BEING-REORGANISED
MX 0010    .ROBERTS-LTD           -LDN ..821/3 #HARDW #-TOOLS         £009000 %30 DE +JONES-&-CO
```

FIG. 2A: *A Columnar input to a KWIC Index. Headings explaining briefly the stylizers used are included in the index. The headings are also explained more fully below, along with the codes used*

MARKETING INTELLIGENCE KWIC INDEX

The index records the activities of a mythical wholesaler/distributor. A separate one-line record is made for each customer/product transaction, containing the following information:

Styliser	Heading used in KWIC index, and explanation
.	Customer (name)
-	Location (an alphabetic code, detailed below)
..	SIC (classification of customer's business by Standard Industrial Classification code)
#	Product class
#-	Product (detailed description, or name)
£	Purchases PA (total amount spent on a particular product or product-class by the customer each year)
%	Our share (this distributor's share of the customer's business in a particular product)
none	Code why not 100% (an indication as to why customer's purchases are not all made from this distributor): CA .. Capacity DE ...Delivery PR....Price QU... Quality SS....Sales Service
+	Competitor (name)

The remaining space on each line can contain comment (not indexed).

Location codes used

-LDN	London area
-MLD	Midlands
-NW	North-west

SIC Codes used

812/4	Wholesale dealing in carpets
..820/2	Retail dealing in meat and fruit
. 821/3	Retail dealing in floor coverings and hardware

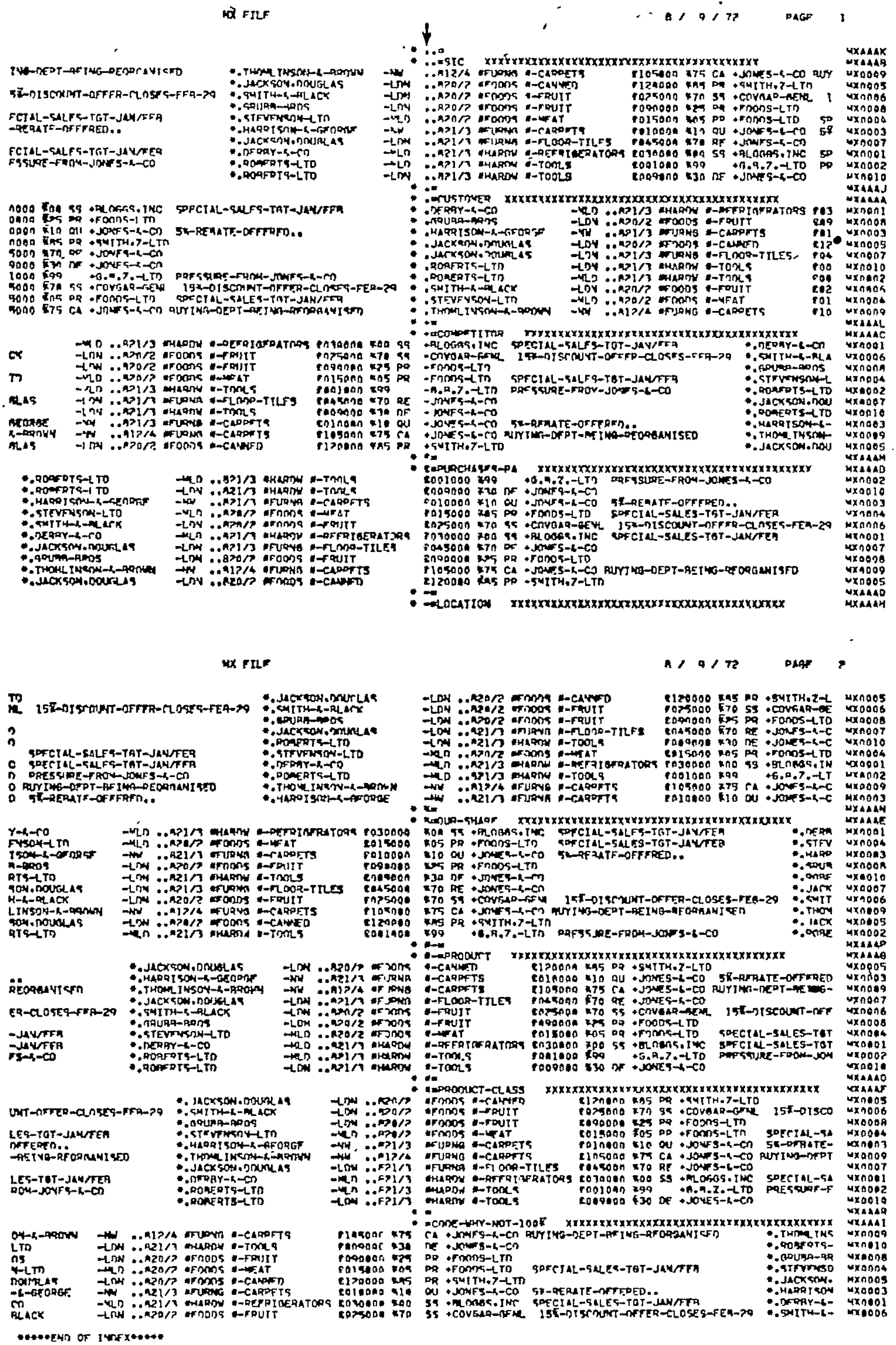
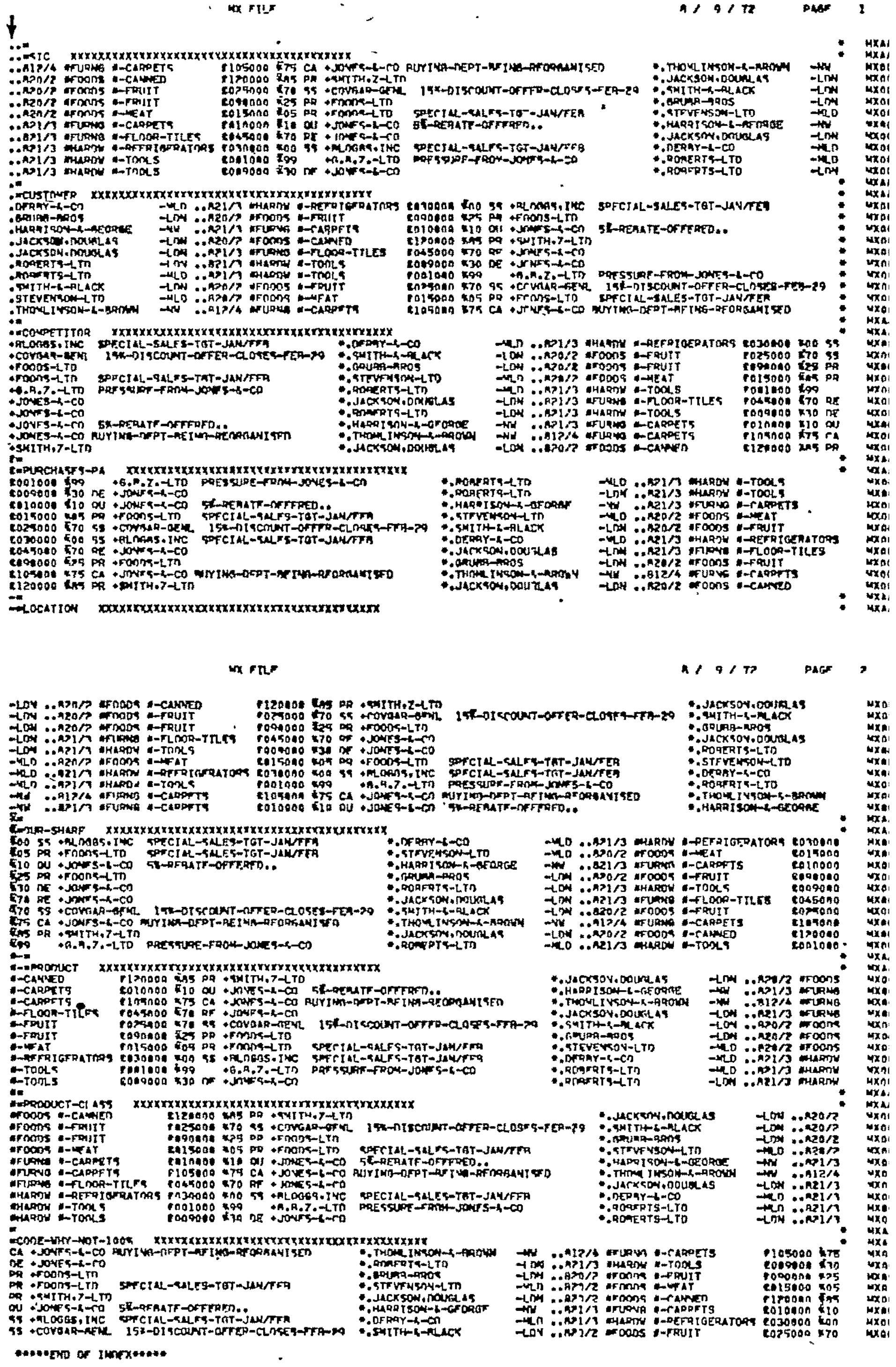


FIG. 2B: *Conventional 'central gutter' KWIC Index, produced from the input shown in Fig. 2A*



```
                                MX FILE                                                              8 / 9 / 72       PAGE    1

..*                                                                                                                     *    MXA
..*SIC    XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX                                                                      *    MXA
..A12/4 #FURNG #-CARPETS        £105000 $75 CA +JONES-&-CO BUYING-DEPT-BEING-REORGANISED      *.THOMLINSON-&-BROWN   -NW      MX0
..A20/2 #FOODS #-CANNED         £120000 $85 PR +SMITH.Z-LTD                                    *.JACKSON.DOUGLAS      -LDN     MX0
..A20/2 #FOODS #-FRUIT          £025000 $70 SS +COVGAR-GENL  15%-DISCOUNT-OFFER-CLOSES-FEB-29  *.SMITH-&-BLACK        -LDN     MX0
..A20/2 #FOODS #-FRUIT          £090000 $25 PR +FOODS-LTD                                      *.GRUBB-BROS           -LDN     MX0
..A20/2 #FOODS #-MEAT           £015000 $05 PR +FOODS-LTD   SPECIAL-SALES-TGT-JAN/FEB          *.STEVENSON-LTD        -MLD     MX0
..A21/3 #FURNG #-CARPETS        £010000 $10 OU +JONES-&-CO  5%-REBATE-OFFERED..                *.HARRISON-&-GEORGE    -NW      MX0
..A21/3 #FURNG #-FLOOR-TILES    £045000 $70 RE +JONES-&-CO                                     *.JACKSON.DOUGLAS      -LDN     MX0
..A21/3 #HARDW #-REFRIGERATORS  £030000 $00 SS +BLOGGS.INC  SPECIAL-SALES-TGT-JAN/FEB          *.DERRY-&-CO           -MLD     MX0
..A21/3 #HARDW #-TOOLS          £001000 $99    +G.B.Z.-LTD  PRESSURE-FROM-JONES-&-CO           *.ROBERTS-LTD          -MLD     MX0
..A21/3 #HARDW #-TOOLS          £009000 $30 DE +JONES-&-CO                                     *.ROBERTS-LTD          -LDN     MX0
.*                                                                                                                      *    MXA
.*CUSTOMER   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX                                                                   *    MXA
.DERRY-&-CO             -MLD ..A21/3 #HARDW #-REFRIGERATORS £030000 $00 SS +BLOGGS.INC  SPECIAL-SALES-TGT-JAN/FEB       *    MX0
.GRUBB-BROS             -LDN ..A20/2 #FOODS #-FRUIT         £090000 $25 PR +FOODS-LTD                                   *    MX0
.HARRISON-&-GEORGE      -NW  ..A21/3 #FURNG #-CARPETS       £010000 $10 OU +JONES-&-CO  5%-REBATE-OFFERED..             *    MX0
.JACKSON.DOUGLAS        -LDN ..A20/2 #FOODS #-CANNED        £120000 $85 PR +SMITH.Z-LTD                                 *    MX0
.JACKSON.DOUGLAS        -LDN ..A21/3 #FURNG #-FLOOR-TILES   £045000 $70 RE +JONES-&-CO                                  *    MX0
.ROBERTS-LTD            -LDN ..A21/3 #HARDW #-TOOLS         £009000 $30 DE +JONES-&-CO                                  *    MX0
.ROBERTS-LTD            -MLD ..A21/3 #HARDW #-TOOLS         £001000 $99    +G.B.Z.-LTD  PRESSURE-FROM-JONES-&-CO        *    MX0
.SMITH-&-BLACK          -LDN ..A20/2 #FOODS #-FRUIT         £025000 $70 SS +COVGAR-GENL  15%-DISCOUNT-OFFER-CLOSES-FEB-29  *  MX0
.STEVENSON-LTD          -MLD ..A20/2 #FOODS #-MEAT          £015000 $05 PR +FOODS-LTD   SPECIAL-SALES-TGT-JAN/FEB       *    MX0
.THOMLINSON-&-BROWN     -NW  ..A12/4 #FURNG #-CARPETS       £105000 $75 CA +JONES-&-CO BUYING-DEPT-BEING-REORGANISED    *    MX0
+*                                                                                                                      *    MXA
+*COMPETITOR   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX                                                                 *    MXA
+BLOGGS.INC   SPECIAL-SALES-TGT-JAN/FEB                 *.DERRY-&-CO          -MLD ..A21/3 #HARDW #-REFRIGERATORS £030000 $00 SS   MX0
+COVGAR-GENL   15%-DISCOUNT-OFFER-CLOSES-FEB-29         *.SMITH-&-BLACK       -LDN ..A20/2 #FOODS #-FRUIT         £025000 $70 SS   MX0
+FOODS-LTD                                              *.GRUBB-BROS          -LDN ..A20/2 #FOODS #-FRUIT         £090000 $25 PR   MX0
+FOODS-LTD    SPECIAL-SALES-TGT-JAN/FEB                 *.STEVENSON-LTD       -MLD ..A20/2 #FOODS #-MEAT          £015000 $05 PR   MX0
+G.B.Z.-LTD   PRESSURE-FROM-JONES-&-CO                  *.ROBERTS-LTD         -MLD ..A21/3 #HARDW #-TOOLS         £001000 $99      MX0
+JONES-&-CO                                             *.JACKSON.DOUGLAS     -LDN ..A21/3 #FURNG #-FLOOR-TILES   £045000 $70 RE   MX0
+JONES-&-CO                                             *.ROBERTS-LTD         -LDN ..A21/3 #HARDW #-TOOLS         £009000 $30 DE   MX0
+JONES-&-CO   5%-REBATE-OFFERED..                       *.HARRISON-&-GEORGE   -NW  ..A21/3 #FURNG #-CARPETS       £010000 $10 OU   MX0
+JONES-&-CO BUYING-DEPT-BEING-REORGANISED               *.THOMLINSON-&-BROWN  -NW  ..A12/4 #FURNG #-CARPETS       £105000 $75 CA   MX0
+SMITH.Z-LTD                                            *.JACKSON.DOUGLAS     -LDN ..A20/2 #FOODS #-CANNED        £120000 $85 PR   MX0
£*                                                                                                                      *    MXA
£*PURCHASES-PA   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX                                                               *    MXA
£001000 $99    +G.B.Z.-LTD  PRESSURE-FROM-JONES-&-CO              *.ROBERTS-LTD         -MLD ..A21/3 #HARDW #-TOOLS            MX0
£009000 $30 DE +JONES-&-CO                                        *.ROBERTS-LTD         -LDN ..A21/3 #HARDW #-TOOLS            MX0
£010000 $10 OU +JONES-&-CO  5%-REBATE-OFFERED..                   *.HARRISON-&-GEORGE   -NW  ..A21/3 #FURNG #-CARPETS          MX0
£015000 $05 PR +FOODS-LTD   SPECIAL-SALES-TGT-JAN/FEB             *.STEVENSON-LTD       -MLD ..A20/2 #FOODS #-MEAT             MX0
£025000 $70 SS +COVGAR-GENL  15%-DISCOUNT-OFFER-CLOSES-FEB-29     *.SMITH-&-BLACK       -LDN ..A20/2 #FOODS #-FRUIT            MX0
£030000 $00 SS +BLOGGS.INC  SPECIAL-SALES-TGT-JAN/FEB             *.DERRY-&-CO          -MLD ..A21/3 #HARDW #-REFRIGERATORS    MX0
£045000 $70 RE +JONES-&-CO                                        *.JACKSON.DOUGLAS     -LDN ..A21/3 #FURNG #-FLOOR-TILES      MX0
£090000 $25 PR +FOODS-LTD                                         *.GRUBB-BROS          -LDN ..A20/2 #FOODS #-FRUIT            MX0
£105000 $75 CA +JONES-&-CO BUYING-DEPT-BEING-REORGANISED          *.THOMLINSON-&-BROWN  -NW  ..A12/4 #FURNG #-CARPETS          MX0
£120000 $85 PR +SMITH.Z-LTD                                       *.JACKSON.DOUGLAS     -LDN ..A20/2 #FOODS #-CANNED           MX0
-*                                                                                                                      *    MXA
-*LOCATION   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX                                                                   *    MXA


                                MX FILE                                                              8 / 9 / 72       PAGE    2

-LDN ..A20/2 #FOODS #-CANNED         £120000 $85 PR +SMITH.Z-LTD                                    *.JACKSON.DOUGLAS       MX0
-LDN ..A20/2 #FOODS #-FRUIT          £025000 $70 SS +COVGAR-GENL  15%-DISCOUNT-OFFER-CLOSES-FEB-29  *.SMITH-&-BLACK         MX0
-LDN ..A20/2 #FOODS #-FRUIT          £090000 $25 PR +FOODS-LTD                                      *.GRUBB-BROS            MX0
-LDN ..A21/3 #FURNG #-FLOOR-TILES    £045000 $70 RE +JONES-&-CO                                     *.JACKSON.DOUGLAS       MX0
-LDN ..A21/3 #HARDW #-TOOLS          £009000 $30 DE +JONES-&-CO                                     *.ROBERTS-LTD           MX0
-MLD ..A20/2 #FOODS #-MEAT           £015000 $05 PR +FOODS-LTD   SPECIAL-SALES-TGT-JAN/FEB          *.STEVENSON-LTD         MX0
-MLD ..A21/3 #HARDW #-REFRIGERATORS  £030000 $00 SS +BLOGGS.INC  SPECIAL-SALES-TGT-JAN/FEB          *.DERRY-&-CO            MX0
-MLD ..A21/3 #HARDW #-TOOLS          £001000 $99    +G.B.Z.-LTD  PRESSURE-FROM-JONES-&-CO           *.ROBERTS-LTD           MX0
-NW  ..A12/4 #FURNG #-CARPETS        £105000 $75 CA +JONES-&-CO BUYING-DEPT-BEING-REORGANISED       *.THOMLINSON-&-BROWN    MX0
-NW  ..A21/3 #FURNG #-CARPETS        £010000 $10 OU +JONES-&-CO  5%-REBATE-OFFERED..                *.HARRISON-&-GEORGE     MX0
$*                                                                                                                      *    MXA
$*OUR-SHARE   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX                                                                  *    MXA
$00 SS +BLOGGS.INC  SPECIAL-SALES-TGT-JAN/FEB             *.DERRY-&-CO          -MLD ..A21/3 #HARDW #-REFRIGERATORS £030000   MX0
$05 PR +FOODS-LTD   SPECIAL-SALES-TGT-JAN/FEB             *.STEVENSON-LTD       -MLD ..A20/2 #FOODS #-MEAT          £015000   MX0
$10 OU +JONES-&-CO  5%-REBATE-OFFERED..                   *.HARRISON-&-GEORGE   -NW  ..A21/3 #FURNG #-CARPETS       £010000   MX0
$25 PR +FOODS-LTD                                         *.GRUBB-BROS          -LDN ..A20/2 #FOODS #-FRUIT         £090000   MX0
$30 DE +JONES-&-CO                                        *.ROBERTS-LTD         -LDN ..A21/3 #HARDW #-TOOLS         £009000   MX0
$70 RE +JONES-&-CO                                        *.JACKSON.DOUGLAS     -LDN ..A21/3 #FURNG #-FLOOR-TILES   £045000   MX0
$70 SS +COVGAR-GENL  15%-DISCOUNT-OFFER-CLOSES-FEB-29     *.SMITH-&-BLACK       -LDN ..A20/2 #FOODS #-FRUIT         £025000   MX0
$75 CA +JONES-&-CO BUYING-DEPT-BEING-REORGANISED          *.THOMLINSON-&-BROWN  -NW  ..A12/4 #FURNG #-CARPETS       £105000   MX0
$85 PR +SMITH.Z-LTD                                       *.JACKSON.DOUGLAS     -LDN ..A20/2 #FOODS #-CANNED        £120000   MX0
$99    +G.B.Z.-LTD  PRESSURE-FROM-JONES-&-CO              *.ROBERTS-LTD         -MLD ..A21/3 #HARDW #-TOOLS         £001000   MX0
#-*                                                                                                                     *    MXA
#-*PRODUCT   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX                                                                   *    MXA
#-CANNED          £120000 $85 PR +SMITH.Z-LTD                                    *.JACKSON.DOUGLAS      -LDN ..A20/2 #FOODS   MX0
#-CARPETS         £010000 $10 OU +JONES-&-CO  5%-REBATE-OFFERED..                *.HARRISON-&-GEORGE    -NW  ..A21/3 #FURNG   MX0
#-CARPETS         £105000 $75 CA +JONES-&-CO BUYING-DEPT-BEING-REORGANISED       *.THOMLINSON-&-BROWN   -NW  ..A12/4 #FURNG   MX0
#-FLOOR-TILES     £045000 $70 RE +JONES-&-CO                                     *.JACKSON.DOUGLAS      -LDN ..A21/3 #FURNG   MX0
#-FRUIT           £025000 $70 SS +COVGAR-GENL  15%-DISCOUNT-OFFER-CLOSES-FEB-29  *.SMITH-&-BLACK        -LDN ..A20/2 #FOODS   MX0
#-FRUIT           £090000 $25 PR +FOODS-LTD                                      *.GRUBB-BROS           -LDN ..A20/2 #FOODS   MX0
#-MEAT            £015000 $05 PR +FOODS-LTD   SPECIAL-SALES-TGT-JAN/FEB          *.STEVENSON-LTD        -MLD ..A20/2 #FOODS   MX0
#-REFRIGERATORS   £030000 $00 SS +BLOGGS.INC  SPECIAL-SALES-TGT-JAN/FEB          *.DERRY-&-CO           -MLD ..A21/3 #HARDW   MX0
#-TOOLS           £001000 $99    +G.B.Z.-LTD  PRESSURE-FROM-JONES-&-CO           *.ROBERTS-LTD          -MLD ..A21/3 #HARDW   MX0
#-TOOLS           £009000 $30 DE +JONES-&-CO                                     *.ROBERTS-LTD          -LDN ..A21/3 #HARDW   MX0
#*                                                                                                                      *    MXA
#*PRODUCT-CLASS   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX                                                              *    MXA
#FOODS #-CANNED          £120000 $85 PR +SMITH.Z-LTD                                    *.JACKSON.DOUGLAS      -LDN ..A20/2   MX0
#FOODS #-FRUIT           £025000 $70 SS +COVGAR-GENL  15%-DISCOUNT-OFFER-CLOSES-FEB-29  *.SMITH-&-BLACK        -LDN ..A20/2   MX0
#FOODS #-FRUIT           £090000 $25 PR +FOODS-LTD                                      *.GRUBB-BROS           -LDN ..A20/2   MX0
#FOODS #-MEAT            £015000 $05 PR +FOODS-LTD   SPECIAL-SALES-TGT-JAN/FEB          *.STEVENSON-LTD        -MLD ..A20/2   MX0
#FURNG #-CARPETS         £010000 $10 OU +JONES-&-CO  5%-REBATE-OFFERED..                *.HARRISON-&-GEORGE    -NW  ..A21/3   MX0
#FURNG #-CARPETS         £105000 $75 CA +JONES-&-CO BUYING-DEPT-BEING-REORGANISED       *.THOMLINSON-&-BROWN   -NW  ..A12/4   MX0
#FURNG #-FLOOR-TILES     £045000 $70 RE +JONES-&-CO                                     *.JACKSON.DOUGLAS      -LDN ..A21/3   MX0
#HARDW #-REFRIGERATORS   £030000 $00 SS +BLOGGS.INC  SPECIAL-SALES-TGT-JAN/FEB          *.DERRY-&-CO           -MLD ..A21/3   MX0
#HARDW #-TOOLS           £001000 $99    +G.B.Z.-LTD  PRESSURE-FROM-JONES-&-CO           *.ROBERTS-LTD          -MLD ..A21/3   MX0
#HARDW #-TOOLS           £009000 $30 DE +JONES-&-CO                                     *.ROBERTS-LTD          -LDN ..A21/3   MX0
*                                                                                                                       *    MXA
*CODE-WHY-NOT-100%   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX                                                           *    MXA
CA +JONES-&-CO BUYING-DEPT-BEING-REORGANISED        *.THOMLINSON-&-BROWN   -NW  ..A12/4 #FURNG #-CARPETS        £105000 $75   MX0
DE +JONES-&-CO                                      *.ROBERTS-LTD          -LDN ..A21/3 #HARDW #-TOOLS          £009000 $30   MX0
PR +FOODS-LTD                                       *.GRUBB-BROS           -LDN ..A20/2 #FOODS #-FRUIT          £090000 $25   MX0
PR +FOODS-LTD   SPECIAL-SALES-TGT-JAN/FEB           *.STEVENSON-LTD        -MLD ..A20/2 #FOODS #-MEAT           £015000 $05   MX0
PR +SMITH.Z-LTD                                     *.JACKSON.DOUGLAS      -LDN ..A20/2 #FOODS #-CANNED         £120000 $85   MX0
OU +JONES-&-CO  5%-REBATE-OFFERED..                 *.HARRISON-&-GEORGE    -NW  ..A21/3 #FURNG #-CARPETS        £010000 $10   MX0
SS +BLOGGS.INC  SPECIAL-SALES-TGT-JAN/FEB           *.DERRY-&-CO           -MLD ..A21/3 #HARDW #-REFRIGERATORS  £030000 $00   MX0
SS +COVGAR-GENL  15%-DISCOUNT-OFFER-CLOSES-FEB-29   *.SMITH-&-BLACK        -LDN ..A20/2 #FOODS #-FRUIT          £025000 $70   MX0

 *****END OF INDEX*****
```

FIG. 2C: *KWIC Index produced from the input shown in Fig. 2A, showing the effect of moving the index line to the left*

Fig 3a

```
                                                                                PAGE 1
-----------------------------------------------------------------------------------------
                    CUSTOMER            PURCHASES  PRODUCT        COMPETITOR
                                          IN £S     CLASS
-----------------------------------------------------------------------------------------
                DENNY-&-CO               30,000    HARDW          BLOGGS,INC

                GRUMB-BROS               90,000    FOODS          FOODS-LTD

                JACKSON,DOUGLAS          45,000    FURNG          JONES-&-CO
                                        120,000    FOODS          SMITH,Z-LT

                SMITH-&-BLACK            25,000    FOODS          COVGAR-GEN

                STEVENSON-LTD            15,000    FOODS          FOODS-LTD

                THOMLINSON-&-BROWN      105,000    FURNG          JONES-&-CO




                                                                                PAGE 2
-----------------------------------------------------------------------------------------
                    CUSTOMER            PURCHASES  PRODUCT        COMPETITOR
                                          IN £S     CLASS
-----------------------------------------------------------------------------------------
GRAND    TOTAL                          430,000
```

Fig 3b

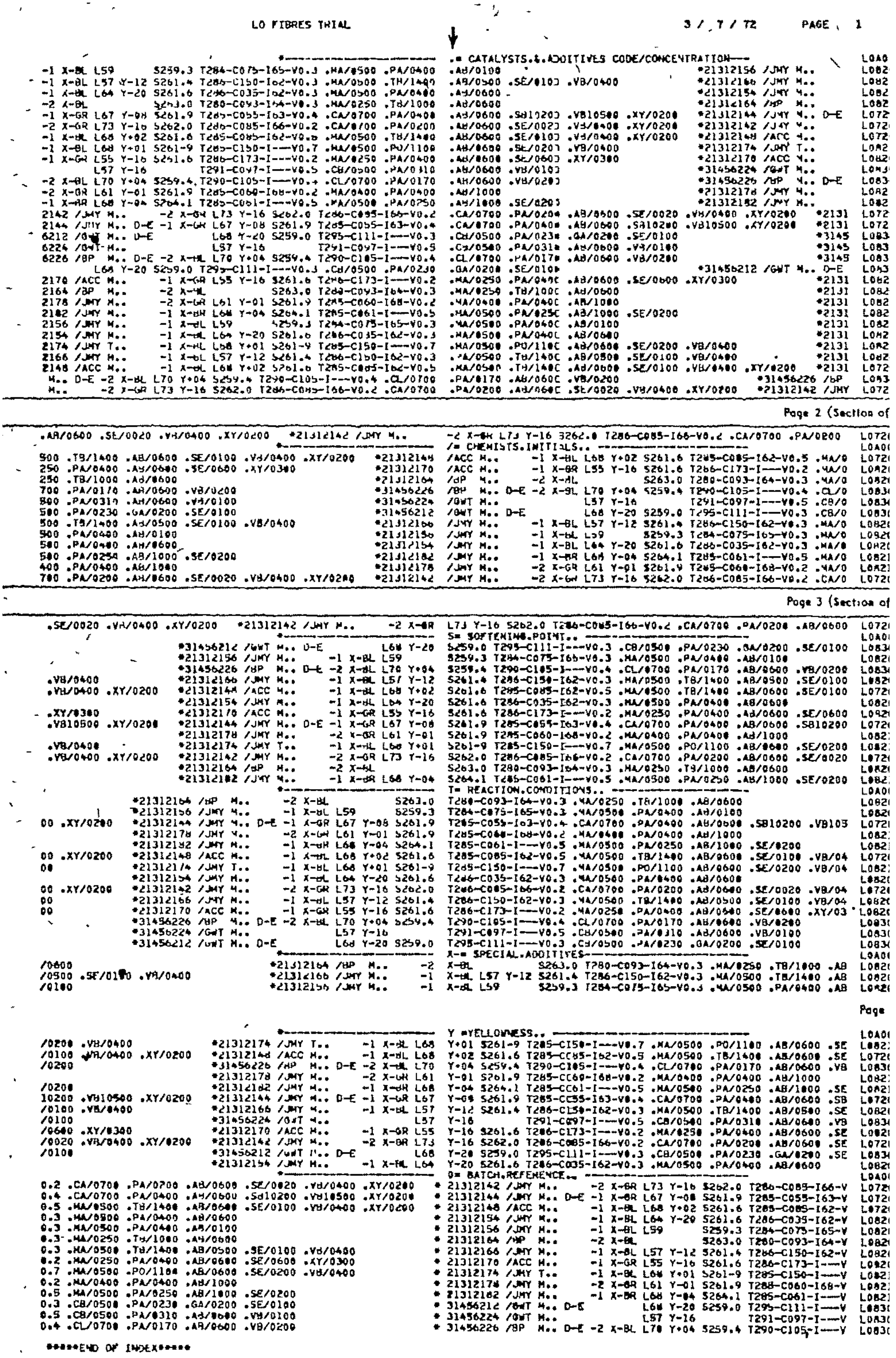
```
                                                                                PAGE 1
-----------------------------------------------------------------------------------------
                RFGION  PURCHASES  % SHARE          COMPETITOR
                          IN £S
-----------------------------------------------------------------------------------------
                 LON     120,000     85             SMITH,Z-LT
                          25,000     70             COVGAR-GEN
                          45,000     70             JONES-&-CO
                          90,000     25             FOODS-LTD
                           9,000     30             JONES-&-CO

REGION   TOTAL   LON     289,000

                 MLD      30,000     00             BLOGGS,INC
                           1,000     99             G.R.Z.-LTD
                          15,000     05             FOODS-LTD

REGION   TOTAL   MLD      46,000

                 NW       10,000     10             JONES-&-CO
                         105,000     75             JONES-&-CO

REGION   TOTAL   NW      115,000



                                                                                PAGE 2
-----------------------------------------------------------------------------------------
                REGION  PURCHASES  % SHARE          COMPETITOR
                          IN £S
-----------------------------------------------------------------------------------------
GRAND    TOTAL           450,000
         AVG.                        46
```

FIG. 3: *Examples of summary reports produced by the Mark IV File Management System from the MX file*

Fig. 3a is a listing by customer, showing purchases, product class, and the main competitor. A total is shown for purchases

Fig. 3b is a listing of purchases by region, showing per cent share and main competitor.

A total for purchases, and regional totals, are shown, together with an overall average for the per cent share



```
                        LO FIBRES TRIAL                           3 / 7 / 72        PAGE   1

                                           *------------------------ .= CATALYSTS.&.ADDITIVES CODE/CONCENTRATION---               L0A0
-1 X-BL L59        S259.3 T284-C075-I65-V0.3 .MA/0500 .PA/0400 .AB/0100                                   *21312156 /JMY M..      L082
-1 X-BL L57 Y-12 S261.4 T286-C150-I62-V0.3 .MA/0500 .TH/1400 .AB/0500 .SE/0100 .VB/0400                   *21312166 /JMY M..      L082
-1 X-BL L64 Y-20 S261.6 T286-C035-I62-V0.3 .MA/0500 .PA/0400 .AB/0600                                     *21312154 /JMY M..      L082
-2 X-BL          S263.0 T280-C093-I64-V0.3 .MA/0250 .TB/1000 .AB/0600                                     *21312164 /BP  M..      L082
-1 X-GR L67 Y-08 S261.9 T285-C055-I63-V0.4 .CA/0700 .PA/0400 .AB/0600 .SB10200 .VB10500 .XY/0200          *21312144 /JMY M.. D-E  L072
-2 X-GR L73 Y-16 S262.0 T286-C085-I66-V0.2 .CA/0700 .PA/0200 .AB/0600 .SE/0020 .VB/0400 .XY/0200          *21312142 /JMY M..      L072
-1 X-BL L68 Y+02 S261.6 T285-C085-I62-V0.5 .MA/0500 .TB/1400 .AB/0600 .SE/0100 .VB/0400 .XY/0200          *21312148 /ACC M..      L072
-1 X-BL L68 Y+01 S261-9 T285-C150-I---V0.7 .MA/0500 .PO/1100 .AB/0600 .SE/0200 .VB/0400                   *21312174 /JMY T..      L082
-1 X-GR L55 Y-16 S261.6 T286-C173-I---V0.2 .MA/0250 .PA/0400 .AB/0600 .SE/0600 .XY/0300                   *21312170 /ACC M..      L082
        L57 Y-16        T291-C097-I---V0.5 .CB/0500 .PA/0310 .AB/0600 .VB/0100                            *31456224 /GWT M..      L083
-2 X-BL L70 Y+04 S259.4 T290-C105-I---V0.4 .CL/0700 .PA/0170 .AB/0600 .VB/0200                            *31456226 /BP  M.. D-E  L083
-2 X-GR L61 Y-01 S261.9 T285-C060-I68-V0.2 .MA/0400 .PA/0400 .AB/1000                                     *21312178 /JMY M..      L082
-1 X-BR L68 Y-04 S264.1 T285-C061-I---V0.5 .MA/0500 .PA/0250 .AB/1000 .SE/0200                            *21312182 /JMY M..      L082
2142 /JMY M..     -2 X-GR L73 Y-16 S262.0 T286-C085-I66-V0.2 .CA/0700 .PA/0200 .AB/0600 .SE/0020 .VB/0400 .XY/0200   *2131  L072
2144 /JMY M.. D-E -1 X-GR L67 Y-08 S261.9 T285-C055-I63-V0.4 .CA/0700 .PA/0400 .AB/0600 .SB10200 .VB10500 .XY/0200 *2131  L072
6212 /GWT M.. D-E         L68 Y-20 S259.0 T295-C111-I---V0.3 .CB/0500 .PA/0230 .GA/0200 .SE/0100                   *3145  L083
6224 /GWT M..             L57 Y-16        T291-C097-I---V0.5 .CB/0500 .PA/0310 .AB/0600 .VB/0100                   *3145  L083
6226 /BP  M.. D-E -2 X-BL L70 Y+04 S259.4 T290-C105-I---V0.4 .CL/0700 .PA/0170 .AB/0600 .VB/0200                   *3145  L083
        L68 Y-20 S259.0 T295-C111-I---V0.3 .CB/0500 .PA/0230 .GA/0200 .SE/0100                   *31456212 /GWT M.. D-E   L083
2170 /ACC M..     -1 X-GR L55 Y-16 S261.6 T286-C173-I---V0.2 .MA/0250 .PA/0400 .AB/0600 .SE/0600 .XY/0300          *2131  L082
2164 /BP  M..     -2 X-BL          S263.0 T280-C093-I64-V0.3 .MA/0250 .TB/1000 .AB/0600                           *2131  L082
2178 /JMY M..     -2 X-GR L61 Y-01 S261.9 T285-C060-I68-V0.2 .MA/0400 .PA/0400 .AB/1000                           *2131  L082
2182 /JMY M..     -1 X-BR L68 Y-04 S264.1 T285-C061-I---V0.5 .MA/0500 .PA/0250 .AB/1000 .SE/0200                  *2131  L082
2156 /JMY M..     -1 X-BL L59          S259.3 T284-C075-I65-V0.3 .MA/0500 .PA/0400 .AB/0100                       *2131  L082
2154 /JMY M..     -1 X-BL L64 Y-20 S261.6 T286-C035-I62-V0.3 .MA/0500 .PA/0400 .AB/0600                           *2131  L082
2174 /JMY T..     -1 X-BL L68 Y+01 S261-9 T285-C150-I---V0.7 .MA/0500 .PO/1100 .AB/0600 .SE/0200 .VB/0400         *2131  L082
2166 /JMY M..     -1 X-BL L57 Y-12 S261.4 T286-C150-I62-V0.3 .MA/0500 .TB/1400 .AB/0500 .SE/0100 .VB/0400         *2131  L082
2148 /ACC M..     -1 X-BL L68 Y+02 S261.6 T285-C085-I62-V0.5 .MA/0500 .TH/1400 .AB/0600 .SE/0100 .VB/0400 .XY/0200 *2131 L072
 M.. D-E -2 X-BL L70 Y+04 S259.4 T290-C105-I---V0.4 .CL/0700 .PA/0170 .AB/0600 .VB/0200                   *31456226 /BP   L083
 M..     -2 X-GR L73 Y-16 S262.0 T286-C085-I66-V0.2 .CA/0700 .PA/0200 .AB/0600 .SE/0020 .VB/0400 .XY/0200  *21312142 /JMY  L072

                                                                                                        Page 2 (Section of

.AB/0600 .SE/0020 .VB/0400 .XY/0200   *21312142 /JMY M..   -2 X-GR L73 Y-16 S262.0 T286-C085-I66-V0.2 .CA/0700 .PA/0200   L072
                                     *-----------------   /= CHEMISTS.INITIALS.. ----------------------                   L0A0
500 .TB/1400 .AB/0600 .SE/0100 .VB/0400 .XY/0200   *21312148  /ACC M..     -1 X-BL L68 Y+02 S261.6 T285-C085-I62-V0.5 .MA/0   L072
250 .PA/0400 .AB/0600 .SE/0600 .XY/0300            *21312170  /ACC M..     -1 X-GR L55 Y-16 S261.6 T286-C173-I---V0.2 .MA/0   L082
250 .TB/1000 .AB/0600                              *21312164  /BP  M..     -2 X-BL          S263.0 T280-C093-I64-V0.3 .MA/0   L082
700 .PA/0170 .AB/0600 .VB/0200                     *31456226  /BP  M.. D-E -2 X-BL L70 Y+04 S259.4 T290-C105-I---V0.4 .CL/0   L083
800 .PA/0310 .AB/0600 .VB/0100                     *31456224  /GWT M..             L57 Y-16        T291-C097-I---V0.5 .CB/0   L083
500 .PA/0230 .GA/0200 .SE/0100                     *31456212  /GWT M.. D-E         L68 Y-20 S259.0 T295-C111-I---V0.3 .CB/0   L083
500 .TB/1400 .AB/0500 .SE/0100 .VB/0400            *21312166  /JMY M..     -1 X-BL L57 Y-12 S261.4 T286-C150-I62-V0.3 .MA/0   L082
500 .PA/0400 .AB/0100                              *21312156  /JMY M..     -1 X-BL L59      S259.3 T284-C075-I65-V0.3 .MA/0   L092
500 .PA/0400 .AB/0600                              *21312154  /JMY M..     -1 X-BL L64 Y-20 S261.6 T286-C035-I62-V0.3 .MA/0   L082
500 .PA/0250 .AB/1000 .SE/0200                     *21312182  /JMY M..     -1 X-BR L68 Y-04 S264.1 T285-C061-I---V0.5 .MA/0   L082
400 .PA/0400 .AB/1000                              *21312178  /JMY M..     -2 X-GR L61 Y-01 S261.9 T285-C060-I68-V0.2 .MA/0   L082
700 .PA/0200 .AB/0600 .SE/0020 .VB/0400 .XY/0200   *21312142  /JMY M..     -2 X-GR L73 Y-16 S262.0 T286-C085-I66-V0.2 .CA/0   L072

                                                                                                        Page 3 (Section of

.SE/0020 .VB/0400 .XY/0200   *21312142 /JMY M..     -2 X-GR L73 Y-16 S262.0 T286-C085-I66-V0.2 .CA/0700 .PA/0200 .AB/0600   L072
                                  *--------------------------- S= SOFTENING.POINT.. -------------------------             L0A0
                 *31456212 /GWT M.. D-E         L68 Y-20 S259.0 T295-C111-I---V0.3 .CB/0500 .PA/0230 .GA/0200 .SE/0100  L083
                 *21312156 /JMY M..     -1 X-BL L59      S259.3 T284-C075-I65-V0.3 .MA/0500 .PA/0400 .AB/0100           L082
                 *31456226 /BP  M.. D-E -2 X-BL L70 Y+04 S259.4 T290-C105-I---V0.4 .CL/0700 .PA/0170 .AB/0600 .VB/0200  L083
.VB/0400         *21312166 /JMY M..     -1 X-BL L57 Y-12 S261.4 T286-C150-I62-V0.3 .MA/0500 .TB/1400 .AB/0500 .SE/0100  L082
.VB/0400 .XY/0200 *21312148 /ACC M..    -1 X-BL L68 Y+02 S261.6 T285-C085-I62-V0.5 .MA/0500 .TB/1400 .AB/0600 .SE/0100  L072
                 *21312154 /JMY M..     -1 X-BL L64 Y-20 S261.6 T286-C035-I62-V0.3 .MA/0500 .PA/0400 .AB/0600           L082
.XY/0300         *21312170 /ACC M..     -1 X-GR L55 Y-16 S261.6 T286-C173-I---V0.2 .MA/0250 .PA/0400 .AB/0600 .SE/0600  L092
.VB10500 .XY/0200 *21312144 /JMY M.. D-E -1 X-GR L67 Y-08 S261.9 T285-C055-I63-V0.4 .CA/0700 .PA/0400 .AB/0600 .SB10200 L072
                 *21312178 /JMY M..     -2 X-GR L61 Y-01 S261.9 T285-C060-I68-V0.2 .MA/0400 .PA/0400 .AB/1000           L082
.VB/0400         *21312174 /JMY T..     -1 X-BL L68 Y+01 S261-9 T285-C150-I---V0.7 .MA/0500 .PO/1100 .AB/0600 .SE/0200  L082
.VB/0400 .XY/0200 *21312142 /JMY M..    -2 X-GR L73 Y-16 S262.0 T286-C085-I66-V0.2 .CA/0700 .PA/0200 .AB/0600 .SE/0020  L072
                 *21312164 /BP  M..     -2 X-BL          S263.0 T280-C093-I64-V0.3 .MA/0250 .TB/1000 .AB/0600           L082
                 *21312182 /JMY M..     -1 X-BR L68 Y-04 S264.1 T285-C061-I---V0.5 .MA/0500 .PA/0250 .AB/1000 .SE/0200  L082
                                  *--------------------------- T= REACTION.CONDITIONS.. ---------------------             L0A0
            *21312164 /BP  M..     -2 X-BL                S263.0 T280-C093-I64-V0.3 .MA/0250 .TB/1000 .AB/0600                  L082
            *21312156 /JMY M..     -1 X-BL L59            S259.3 T284-C075-I65-V0.3 .MA/0500 .PA/0400 .AB/0100                  L082
00 .XY/0200 *21312144 /JMY M.. D-E -1 X-GR L67 Y-08 S261.9 T285-C055-I63-V0.4 .CA/0700 .PA/0400 .AB/0600 .SB10200 .VB105    L072
            *21312178 /JMY M..     -2 X-GR L61 Y-01 S261.9 T285-C060-I68-V0.2 .MA/0400 .PA/0400 .AB/1000                  L082
            *21312182 /JMY M..     -1 X-BR L68 Y-04 S264.1 T285-C061-I---V0.5 .MA/0500 .PA/0250 .AB/1000 .SE/0200         L082
00 .XY/0200 *21312148 /ACC M..     -1 X-BL L68 Y+02 S261.6 T285-C085-I62-V0.5 .MA/0500 .TB/1400 .AB/0600 .SE/0100 .VB/04  L072
00          *21312174 /JMY T..     -1 X-BL L68 Y+01 S261-9 T285-C150-I---V0.7 .MA/0500 .PO/1100 .AB/0600 .SE/0200 .VB/04  L082
            *21312154 /JMY M..     -1 X-BL L64 Y-20 S261.6 T286-C035-I62-V0.3 .MA/0500 .PA/0400 .AB/0600                  L082
00 .XY/0200 *21312142 /JMY M..     -2 X-GR L73 Y-16 S262.0 T286-C085-I66-V0.2 .CA/0700 .PA/0200 .AB/0600 .SE/0020 .VB/04  L072
00          *21312166 /JMY M..     -1 X-BL L57 Y-12 S261.4 T286-C150-I62-V0.3 .MA/0500 .TB/1400 .AB/0500 .SE/0100 .VB/04  L082
00          *21312170 /ACC M..     -1 X-GR L55 Y-16 S261.6 T286-C173-I---V0.2 .MA/0250 .PA/0400 .AB/0600 .SE/0600 .XY/03  L082
            *31456226 /BP  M.. D-E -2 X-BL L70 Y+04 S259.4 T290-C105-I---V0.4 .CL/0700 .PA/0170 .AB/0600 .VB/0200         L083
            *31456224 /GWT M..            L57 Y-16        T291-C097-I---V0.5 .CB/0500 .PA/0310 .AB/0600 .VB/0100         L083
            *31456212 /GWT M.. D-E        L68 Y-20 S259.0 T295-C111-I---V0.3 .CB/0500 .PA/0230 .GA/0200 .SE/0100         L083
                                  *--------------------------- X-= SPECIAL.ADDITIVES-------------------------             L0A0
/0600                          *21312164 /BP  M..  -2  X-BL             S263.0 T280-C093-I64-V0.3 .MA/0250 .TB/1000 .AB  L082
/0500 .SE/0100 .VB/0400        *21312166 /JMY M..  -1  X-BL L57 Y-12    S261.4 T286-C150-I62-V0.3 .MA/0500 .TB/1400 .AB  L082
/0100                          *21312156 /JMY M..  -1  X-BL L59         S259.3 T284-C075-I65-V0.3 .MA/0500 .PA/0400 .AB  L082

                                                                                                        Page

                                  *--------------------------- Y =YELLOWNESS.. -----------------------------             L0A0
/0200 .VB/0400           *21312174 /JMY T..     -1 X-BL L68 Y+01 S261-9 T285-C150-I---V0.7 .MA/0500 .PO/1100 .AB/0600 .SE  L082
/0100 .VB/0400 .XY/0200  *21312148 /ACC M..     -1 X-BL L68 Y+02 S261.6 T285-C085-I62-V0.5 .MA/0500 .TB/1400 .AB/0600 .SE  L072
/0200                    *31456226 /BP  M.. D-E -2 X-BL L70 Y+04 S259.4 T290-C105-I---V0.4 .CL/0700 .PA/0170 .AB/0600 .VB  L083
                         *21312178 /JMY M..     -2 X-GR L61 Y-01 S261.9 T285-C060-I68-V0.2 .MA/0400 .PA/0400 .AB/1000      L082
/0200                    *21312182 /JMY M..     -1 X-BR L68 Y-04 S264.1 T285-C061-I---V0.5 .MA/0500 .PA/0250 .AB/1000 .SE  L082
10200 .VB10500 .XY/0200  *21312144 /JMY M.. D-E -1 X-GR L67 Y-08 S261.9 T285-C055-I63-V0.4 .CA/0700 .PA/0400 .AB/0600 .SB  L072
/0100 .VB/0400           *21312166 /JMY M..     -1 X-BL L57 Y-12 S261.4 T286-C150-I62-V0.3 .MA/0500 .TB/1400 .AB/0500 .SE  L082
/0100                    *31456224 /GWT M..             L57 Y-16        T291-C097-I---V0.5 .CB/0500 .PA/0310 .AB/0600 .VB  L083
/0600 .XY/0300           *21312170 /ACC M..     -1 X-GR L55 Y-16 S261.6 T286-C173-I---V0.2 .MA/0250 .PA/0400 .AB/0600 .SE  L082
/0020 .VB/0400 .XY/0200  *21312142 /JMY M..     -2 X-GR L73 Y-16 S262.0 T286-C085-I66-V0.2 .CA/0700 .PA/0200 .AB/0600 .SE  L072
/0100                    *31456212 /GWT M.. D-E         L68 Y-20 S259.0 T295-C111-I---V0.3 .CB/0500 .PA/0230 .GA/0200 .SE  L083
                         *21312154 /JMY M..     -1 X-BL L64 Y-20 S261.6 T286-C035-I62-V0.3 .MA/0500 .PA/0400 .AB/0600      L082
                                  *--------------------------- 0= BATCH.REFERENCE.. -------------------------             L0A0
0.2 .CA/0700 .PA/0200 .AB/0600 .SE/0020 .VB/0400 .XY/0200   * 21312142 /JMY M..     -2 X-GR L73 Y-16 S262.0 T286-C085-I66-V  L072
0.4 .CA/0700 .PA/0400 .AB/0600 .SB10200 .VB10500 .XY/0200   * 21312144 /JMY M.. D-E -1 X-GR L67 Y-08 S261.9 T285-C055-I63-V  L072
0.5 .MA/0500 .TB/1400 .AB/0600 .SE/0100 .VB/0400 .XY/0200   * 21312148 /ACC M..     -1 X-BL L68 Y+02 S261.6 T285-C085-I62-V  L072
0.3 .MA/0500 .PA/0400 .AB/0600                              * 21312154 /JMY M..     -1 X-BL L64 Y-20 S261.6 T286-C035-I62-V  L082
0.3 .MA/0500 .PA/0400 .AB/0100                              * 21312156 /JMY M..     -1 X-BL L59      S259.3 T284-C075-I65-V  L082
0.3 .MA/0250 .TB/1000 .AB/0600                              * 21312164 /BP  M..     -2 X-BL          S263.0 T280-C093-I64-V  L082
0.3 .MA/0500 .TB/1400 .AB/0500 .SE/0100 .VB/0400            * 21312166 /JMY M..     -1 X-BL L57 Y-12 S261.4 T286-C150-I62-V  L082
0.2 .MA/0250 .PA/0400 .AB/0600 .SE/0600 .XY/0300            * 21312170 /ACC M..     -1 X-GR L55 Y-16 S261.6 T286-C173-I---V  L082
0.7 .MA/0500 .PO/1100 .AB/0600 .SE/0200 .VB/0400            * 21312174 /JMY T..     -1 X-BL L68 Y+01 S261-9 T285-C150-I---V  L082
0.2 .MA/0400 .PA/0400 .AB/1000                              * 21312178 /JMY M..     -2 X-GR L61 Y-01 S261.9 T285-C060-I68-V  L082
0.5 .MA/0500 .PA/0250 .AB/1000 .SE/0200                     * 21312182 /JMY M..     -1 X-BR L68 Y-04 S264.1 T285-C061-I---V  L082
0.3 .CB/0500 .PA/0230 .GA/0200 .SE/0100                     * 31456212 /GWT M.. D-E         L68 Y-20 S259.0 T295-C111-I---V  L083
0.5 .CB/0500 .PA/0310 .AB/0600 .VB/0100                     * 31456224 /GWT M..             L57 Y-16        T291-C097-I---V  L083
0.4 .CL/0700 .PA/0170 .AB/0600 .VB/0200                     * 31456226 /BP  M.. D-E -2 X-BL L70 Y+04 S259.4 T290-C105-I---V  L083

 *****END OF INDEX*****
```

FIG. 4: *A highly-coded KWIC Index to laboratory data*

REFERENCES

1 LUHN, H. P. Keyword in Context Index for Technical Literature (KWIC index). Yorktown Heights, NY: IBM Advanced Systems Development Division, 1959.

2 FISHER, MARGUERITE. The KWIC Index Concept—A Retrospective View. *Amer. Doc.*, 17, 1966, p. 57–70.

3 *Chemical Titles.* Columbus, Ohio: Chemical Abstracts Service.

4 CHANDOR, A., GRAHAM, J. *and* WILLIAMSON, R. Practical Systems Analysis. London: Rupert Hart-Davis Educational Publications, 1969.

5 Mark IV File Management System. Informatics Inc., 21050 Vanowen St., Canoga Park, Calif. 91303, USA.

DISCUSSION

DR D. A. LEWIS (ICI Plastics Division): 'What are the costs of running and updating KWIC indexes?'

MR SHILLINGFORD: 'The best way of answering the question may be to use two examples. The charges quoted will relate to our own operation. Charges for specific operations, and indeed the system for calculating charges, may be different at other installations.

The first example concerns the addition of 1,000 new items to a file of 15,000 items, and printing a KWIC of the updated file. The index occupied 98,000 lines of print, or approximately 2,000 pages of printout—a fairly large file. The cost of the run was £43.30, which is equivalent to 4.3p per item added, or 0.04p per index entry for a file update and print.

The second example concerns a file of more normal size. A file was built up steadily to 7,000 items in 50 weekly runs, printing a cumulated file from tape every other week. The total cost for the year's operation works out to 3p per item added. The costs quoted for both examples are for computer operations and printing only.

Card punching costs us 1.6p per card. There may be less than 2 cards/item so a cost of approximately 3p/item is involved. For this an average of 6–7 indexing entries will appear in the KWIC. The punching cost is therefore approximately 0.5p/index entry. This cost occurs for each item only once in the life of the file, that is at the time of input to the file.'

DR LEWIS: 'Please compare KWIC versus KWOC.'

DR MATTHEWS: 'The KWIC concept calls for indexing in the centre of the line, hence the Key Word in *Context*. What preceded the Keyword is found by shifting the eyes to the left; what follows the keyword is ordered in alphabetical or numerical sequence due to the sort field which extends beyond the keyword. These features make centre-line indexing efficient to use.

In KWOC, which in its original meaning refers to Keywords taken automatically from the text of the entry and not to assigned subject descriptors, the keyword becomes a subject heading and the entries follow in "random" sequence.

The KWOC looks more like a conventional subject index but is less efficient to use. KWOC tends to be more voluminous than the same index in KWIC form; even with low frequency of indexing the size of the index can be almost doubled. KWOC is more pleasing to those who have not appreciated the advantages of the "context" index.'

MR PETER THOMAS (GLC Dept of Planning & Transportation): 'What steps, if any, are taken to control synonyms and make provision for hierarchical searches?'

DR MATTHEWS: 'In the normal way, the user is reminded that word guides and thesauri are available as search aids and their use is encouraged. If the user wishes to put "see" and "see also" entries in the KWIC they will be automatically indexed as user aids. If a controlled vocabulary is preferred then the KWIC can be used to control "wild" entries and misspellings. Both show up well by scanning the KWIC. It is one of the best aids to editing that I know.'

MR THOMAS: 'By whom and at what stage are accession numbers assigned for personal KWIC indexes?'

DR MATTHEWS: 'Normally accession numbers are assigned at input by the person making the entry. In a personal index maintained by the person himself a pad of input forms is kept at hand and the entries are made and numbered as they are needed. The first two characters are the "tag", and are the same for all entries in a particular file; the rest is often a simple serial number, or month plus a serial number.

In order to express months in a single character we have used 1 to 9 for January to September and X, Y, Z for October, November, December. Although very artificial it works well, e.g. CT3010 and CTZ101 are from the CT index, tenth entry in March and one hundred and first entry in December respectively.'

MRS GERALDINE WALKER (College of Librarianship, Wales): 'What is the value of centre-line indexing as opposed to the use of the more conventional left-hand margin?'

DR MATTHEWS: 'Left-hand margin KWIC is useful in Columnar presentation and particularly for data indexes, where the "*in context*" feature is not very important. In indexes of text material the centre-line indexes have real advantages.'

MR D. AUSTIN (Precis Research Project, BNB): 'How do added keywords fit into the notion of Context?'

DR MATTHEWS: 'Since they are out of context to start with, a KWIC index containing added keywords is not fully in context, but the title and all added keywords are carried with each indexing entry without redundant printing of the keyword.'

MR M. ABBOTT (Smith, Kline & French): 'How do you handle large printouts?'

DR MATTHEWS: 'The printing of large indexes can be expensive so they are avoided where possible by a cycle of updates, say, weekly for a month, monthly for a quarter, and a full index quarterly. This involves looking in three printouts, but is less expensive. Quarterly updates of 20,000 pages have been run successfully for an index which is in daily use. This can be less expensive than, say, a manually maintained card file of the same size. Computer Output Microfilm (COM) provides an economical answer to the problem and is being more widely considered.'

MR ALAN CLARE (Guest Keen & Nettlefolds): 'Although ICI have written their own programs, have they any experience with IBM's KWIC programs? Are ICI's programs available? If so, how much do they cost?'

MR MATTHEWS: 'A number of other KWIC programs are available but none provide all of the control features described in the paper. The ICI programs are available at a cost of approximately £1,000, which provides for single and multifile operation, as well as maintenance, updating and cumulation routines.'

A cost-benefit study of a manually-produced current awareness bulletin

R. A. Nightingale

British Petroleum Company Limited

Introduction

IN THE CURRENT atmosphere of concern with costs, both of need to reduce expenditure and also to justify that which is being spent, it would seem to be a good idea to try to determine the cost-benefits of some of the services offered by an information unit, a view expressed by Mr C. G. Giles at the 1972 Aslib Annual Conference. Kramer[1] covered one aspect by estimating how much time non-library staff spent on searching and comparing this with that spent by library staff. Unfortunately he was forced to rely on pure estimates, no actual tests being carried out. If, however, one looks at the current awareness bulletin aspect of a service it would seem possible to obtain a more exact measure by determining how many journals the staff themselves would need to scan if no current awareness bulletin were available. Accordingly, it was decided to try to obtain this information by means of a questionnaire survey of the readers of one of British Petroleum's technical information bulletins.

Background

The Central Information and Library Service is a general service operating for the benefit of all departments of the Head Office of the British Petroleum Company Limited in London and, also, to a lesser extent, for other centres of the BP Group of companies. Part of this service is to prepare a current awareness bulletin of major technical articles covering all subjects of interest to the London Office staff.

This bulletin appears approximately twice weekly and takes two forms, one of journal articles selected from some 180 titles, and one of pamphlet material from a wide range of miscellaneous sources. Only the journal article version of the bulletin will be considered for this study.

The bulletin consists of titles only (no abstracts), supplemented, where necessary, by additional phrases where the titles are considered to be an inadequate guide to the subject content of the article. The titles are grouped under some fifty-five general subject headings within the bulletin, e.g. Corrosion and its control, Mechanical Engineering, etc., and some three hundred copies are distributed to individual readers in the London Office and to central points in other centres.

The Survey

It has been the practice to conduct a questionnaire survey of the readership every few years to determine whether any changes in journal and/or subject coverage should be considered, to meet the changing information requirements of the readers. It was decided that, since another user interest survey was due, it would be possible to combine this with an attempt to determine how many extra journals staff would scan if the bulletin were not available; from this to estimate the cost to the Company of their spending time scanning these journals and, by calculation of the cost of producing the bulletin, to find the difference or cost benefit.

A suitable questionnaire was, therefore, produced (see Appendix I) and sent to all recipients of the bulletin, some 288 copies being distributed initially, followed by a further sixteen copies, on request, to cover some London Office staff who see the bulletin on circulation. The results of the sections dealing with journal coverage etc. (questions 3 to 8 in the questionnaire) will not be dealt with here, since this is of interest only to people within the BP Group. A list of the journals covered by the bulletin was attached to the questionnaire to assist staff in determining how many extra journals they would need to see.

Results

Of the 304 copies distributed, eighty-nine were returned inside a period of thirty working days, at which time the survey was closed. This is only a 29 per cent return and it was felt that, before too much reliance was placed on these returns, a 10 per cent sample of the non-respondents should be approached with a follow-up memo and second copy of the questionnaire to see whether their replies were significantly different from the primary returns. Twenty copies of the memo and questionnaire were, therefore, distributed to a random sample of the non-respondents, ten of whom replied and the results were found to be basically similar to those arising from the main batch of eighty-nine.

Results of the numbers of extra journals that staff would scan in the absence of the bulletin are shown in two histograms in Appendix II, one for the main batch of returned questionnaires, on which subsequent cost calculations are based, and one for the follow-up batch of ten returned questionnaires. In both cases, median figures are taken, since it was felt that the few high returns would produce an unrealistic average figure. From these histograms it can be seen that the median figure is six journals.

In any study of this nature it is necessary to make certain assumptions. In this case they are as follows:

1. The questionnaires returned (29 per cent of the 304 distributed) are a fair cross-section of the total readership. This is at least partially confirmed by the supplementary survey.
2. Whereas approximately three hundred copies of the bulletin are distributed, the total readership is of the order of four hundred, bearing in mind that the centres outside the London Office almost certainly circulate the bulletin to a large number of readers.
3. Of the six journals which would be scanned were there no bulletin available, one is a weekly and five are monthly in publication.
4. Each issue would take a reader ten minutes to scan, excluding any time spent reading articles. The technical information officers in the Central Information and Library Service unit average eight minutes per issue.

5. The average salary of the readers is £3,000 which, with overheads, is taken to be a total cost to the Company of £7,000 per annum.
6. The cost of distribution of the bulletin and any photocopying costs are not taken into account, since these are considered to be substantially less than the cost of increased journal purchase, distribution and/or circulation, in the absence of a bulletin.
7. An alternative system of purchasing and circulating an externally produced current awareness bulletin is not costed since, to our knowledge, no external service exists which completely meets the needs of BP's London Office staff.

Calculation

One weekly plus five monthly journals produce 112 issues per year. At a scanning time of ten minutes per issue, this means that, on average, each reader would spend an extra 1120 minutes or 18½ hours per year scanning journals.

On the basis of salary plus overheads at £7,000 per year, the average reader, assuming he works forty-eight weeks at thirty-six hours per week, costs the Company around £4 per hour.

The 18½ hours of his time which he would have to spend scanning journals is, therefore, worth £74 and, for an estimated readership of four hundred, this comes out at total figure of £29,600.

The cost of production of the bulletin has been calculated as follows:

Technical information staff and typing staff, salaries plus overheads	£1,500 p.a.
Paper	120
Off-set plates	380
Printing staff time and overheads	500
	£2,500

The cost benefit of the use of the bulletin is, therefore, £29,600 less £2,500, or roughly £27,000 per annum.

Summary

While it is accepted that some of the assumptions made earlier are arguable, it is fairly clear that even if one takes a more pessimistic view, and these assumptions are considered by us to err on the conservative side in all cases, then there seems to be quite clearly a substantial cost benefit in the preparation and wide distribution of a manually prepared current awareness bulletin. In the case of our bulletin it is of the order of £27,000 per annum.

Acknowledgements

I should like to thank Mr P. T. W. Akroyd, Head of the information service described, for whom this survey was conducted, for his assistance in preparing the questionnaire and for his suggestion that, since other libraries/information units might find the survey technique of value, it should be published.

REFERENCE

1 KRAMER, J. How to survive in industry. Cost justifying library services. *Spec. Libraries*, November 1971, p. 487–9.

APPENDIX I

T.I.L.S. Technical Literature Index Questionnaire

1. How many journals, approximately, do you see in addition to scanning the T.I.L.S. Index? ....

2. How many journals do you estimate it would be necessary for you to see if the T.I.L.S. Index were not available (a list of journals covered by the T.I.L.S. Index is attached as an appendix)? ....

3. (a) If you see any other BP-produced current awareness bulletin, please state which

....

....

....

(b) If you do, please state briefly why you see more than one

....

....

....

4. (a) If you see any abstract journal/current awareness bulletin produced outside the company, please state which

....

....

....

(b) If you do, please state briefly why you see these in addition to the T.I.L.S. Index

....

....

....

5. Please list any subjects you feel the T.I.L.S. Index should cover more fully

....

....

6. Please list any subjects not covered at all by the T.I.L.S. Index which you feel should be covered

....

....

....

7. Please list any journals not covered by the T.I.L.S. Index (see appendix) which you feel should be covered

....

....

....

8. (a) On balance, do you consider the T.I.L.S. Index adequately meets your needs for current technical information?

Yes/No

(b) If No, please give any reasons not covered by previous questions

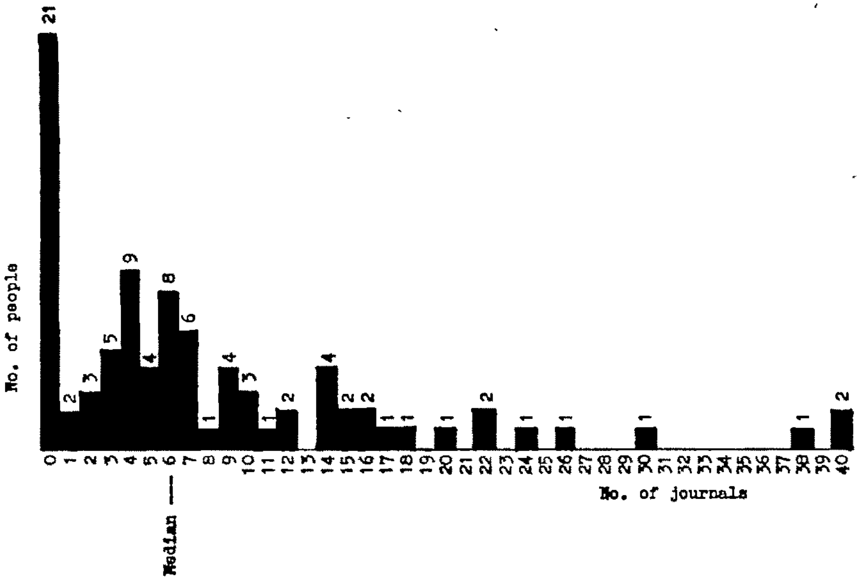
....

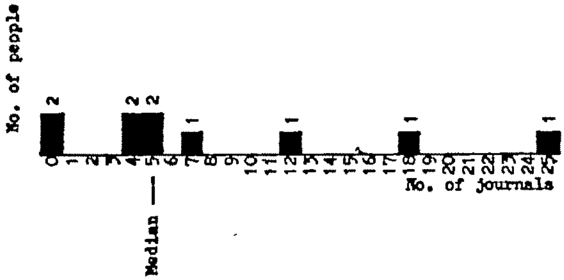
....

....

....

APPENDIX II


Extra journals histogram—Primary survey


Extra journals histogram—Supplementary survey

BRIEF REVIEWS

THE ACADEMIC WHO'S WHO, 1973–1974: University teachers in the British Isles in Arts, Education and Social Sciences. London: A. & C. Black, 1973. 521 pp. £7.50. (ISBN 0 7136 1340 8)

The preamble states that this is the first biographical dictionary of university teachers in the British Isles in all disciplines other than sciences. There are, however, a few borderline cases of teachers of subjects one would not expect to find in a list of teachers in 'arts, education and social sciences', and there is also surely a gap between 'all disciplines other than sciences' and 'arts, education and social sciences'. A second volume of scientists and engineers is under consideration.

The individuals covered are those who have held a university appointment for five years or more; they were invited to submit biographical details and their completed questionnaires have been checked and edited and were submitted in proof form for correction or emendation up to August 1972. Details of most 1972–73 new appointments were known then and have been included.

At the front of the book is a twenty-page list of abbreviations used. This is followed by the entries in an alphabetical sequence. Each entry includes a description of positions held, degrees and qualifications, age, marital status, list of publications including contributions to learned journals, and the individual's current university address. The inconsistency in depth of detail of entries is presumably a result of individualistic filling-in of questionnaires. A stronger criticism, however, is that details of specific subject interests and/or research are omitted.

It is intended to produce a new and revised edition of this book biennially, shortly after the beginning of the academic year. This volume therefore promises to be the first of a useful series which can take its place among the reference books with the other who's whos and university guides.

BENNETT, FREDERICK. Cataloguing in practice: the organisation of book acquisition in libraries. London: Bingley, 1972. 74 pp. £1.50. (ISBN 0 85157 141 7)

Believing that centralized and co-operative cataloguing are still not sufficiently advanced to replace local cataloguing, Bennett sets out to produce an eminently practical guide to the routine of cataloguing which, he considers, is neglected in courses and in the more learned accounts of the field. He is also concerned to set the process of cataloguing in its day-to-day context and so includes short chapters on selection and ordering methods, principles of classification, accommodation planning, organization and furniture, and the preparation of book lists.

Other useful chapters cover: a practical routine for cataloguing; a survey of card reproduction methods (which provides *inter alia* a useful cost per card); and the flatbed silk-screen frame, a duplicator specially designed by the author for cataloguers and costing under £1 to construct. There are also brief chapters on the specific problem posed by cataloguing in school and special libraries.

As may readily be seen, the emphasis throughout is on the clerical element, with little mention of the intellectual intricacies of cataloguing. Thus, though much of the ground is covered within Horner's and Bakewell's broader works, students and practitioners may find this thin book less intimidating if their concern is only with the organization of the clerical procedures.

However, one criticism seems in place: the paucity of references—fourteen in the whole book—which makes it impossible to follow up points of interest. It is also a pity that important items like Bakewell's manual and the survey of catalogue card reproduction in the *Library and Information Bulletin, no. 17*, were presumably published too late for mention.

ELSEVIER'S DICTIONARY OF LIBRARY SCIENCE INFORMATION AND LIBRARIANSHIP, compiled by W. E. Clason, Amsterdam: Elsevier, 1973. 597 pp. Dfl. 85.00. (ISBN 0 444 41018 X)

The dictionary encompasses several wide ranging subjects, though the main fields covered are closely related. It is compiled and arranged on an English alphabetical basis; brief entries are given, with explanatory notes in English where necessary, and translation of the entry word into French, Spanish, Italian, Dutch and German. For each language an alphabetical index refers to corresponding numbers in the basic table.

In clarification of the various topics the author has listed specific documents; in itself an unusual approach which will do much to assist operational scientists.

G. G. BAKER AND ASSOCIATES. A guide to COM in the United Kingdom. 3rd ed. Guildford: G. G. Baker and Associates, September 1972. 96 pp. £5.00. (ISBN 0 9502082 2 1)

The 3rd edition of the guide provides a state-of-the-art survey on Computer Output Microfilm, completely revising and expanding the earlier editions of April and September 1971.

The mechanics, advantages and limitations of COM recordings are very fully covered. Other chapters relate to film formats in use, processing and duplicating methods, application and system design factors, machine specifications, details of Bureaux operating in Britain, the Standards situation and terms used in COM recording.

The section dealing with COM hardware is much more comprehensive, emphasizing details of software programs, input requirements, and output formats.

An extra thirty-six pages in this edition cover new suppliers of COM equipment, in particular COM peripherals, software programs available from manufacturers, processing of COM generated films, and an excellent bibliography compiled by the National Reprographic Centre for Documentation.

G. G. BAKER AND ASSOCIATES. A guide to microfilm readers and reader-printers. 2nd ed. Guildford: G. G. Baker and Associates, January 1973. 128 pp. £5.00. (ISBN 0 9502802 3 X)

This edition, giving a comprehensive review of machines available on the UK market, totally updates the 1st edition published in April 1972.

Extended introductory chapters outline the range of microforms in use in Europe, typical characteristics of reading equipment, significance and application of input options, indexing methods and ergonomics. An illustrated chapter on cartridges and cassettes is followed by a listing of printout methods.

Condensed selector charts briefly tabulate the main features of all readers; further details of input options, magnifications, screen and print sizes, print methods, film movements, image rotations, roll film scan, dimensions, weight and price are given with an illustration for each machine.

The concluding chapter contains sources of additional information.

IRVINE, RUTH. MARC for cataloguers: an explanation of its use. Southampton: the University, 1972. 40 pp. (Southampton University Library automation project report no. 4) (ISBN 0 85432 090 3)

These notes were prepared for distribution to participants in the SCONUL Seminar on Practical MARC Cataloguing held at Southampton University in April 1972. They are reprinted for conventional cataloguers wanting a brief survey of practical MARC (Machine Readable Cataloguing) and for library school students.

After a brief account of the computer's rôle in MARC, there is a summary of the schedules, i.e. list of MARC tags, which are reproduced in full at the end of the report. Slight differences exist between some Southampton and BNB tags, and these are asterisked.

The distinction in the schedules between field tags, indicators and subfield codes is then explained. There follow brief sections on local tags, control fields and the leader and directory which begin each machine record and summarize its contents. Next comes a description of how certain tags may be exploited to make the computer generate added entries automatically. Finally, a completed specimen Southampton University Library input form is reproduced to illustrate the use in practice of the tags previously discussed.

The author's deliberate avoidance of all aspects of MARC which are not of immediate concern to the working cataloguer makes her notes an extremely useable introduction to practical MARC cataloguing.

LIMBACHER, JAMES L. A reference guide to audiovisual information. New York, London: Bowker, 1972. 197 pp. £7.50. (ISBN 0 8352 0546 0)

This guide is designed to help the audiovisual librarian answer his own and his users' reference enquiries. The term 'audiovisual' is defined to include not only media (motion pictures, filmstrips, records, tapes, radio and television), but also art forms (theatre, music and dance), since to-day these are so often approached through audiovisual media.

The book starts with a list of suggested headings and contents for a ready reference file. This is followed by an alphabetical title list of reference books (including annuals), briefly annotated, with their prices on the American market. Then comes a similar listing of important periodicals. The two lists are then conpounded to produce a listing by subject.

This is followed by a useful glossary of audiovisual terms and a publishers' address list. Finally, there is a very extensive, broadly classified list of books 'not primarily for reference use, but valuable for background and enrichment'.

Nearly all the materials listed are in English, but the work of, for example, film directors in non-English-speaking countries appears to be fairly well covered. The main drawback for non-American users is that prices are quoted in American currency and that no addresses of overseas agents for American publishers are given.

WICKS, VERA M., *ed.* Directory of Special Libraries in Australia. 3rd ed. Sydney: Library Assn. of Australia, 1972. 202 pp. (ISBN 0 909915 113)

This is a useful addition to existing library directories, the more so as Australian special libraries have, according to the introduction, increased in number from 505 to 780 since the second edition of this work was published in 1961.

Libraries attached to societies, institutions, associations, government departments, public utilities and commercial organizations are covered; this definition includes most university departmental libraries, but not the main university libraries, the special collections in the National Library and the state libraries, nor most technical and teachers' college libraries.

Arrangement of the entries is, as is usual, by administrative area, but—and this is not usual!—a complete name index is supplied to help those unfamiliar with Australian geography.

The content of individual entries has been expanded to comprise: library code, address, staff complement, date of establishment, size of stock, main subject fields and the telephone number for inter-library loans where such loans are made. Any special restrictions on lending are appended, but it has been assumed throughout that individuals outside the organization served have no borrowing rights. These indications of lending policy are supplemented by the appended reproduction of the inter-library loan code promulgated by the Australian Advisory Council on Bibliographical Services.

In addition to the name index the work is fitted with a full subject index.

WILLIAMS, JAMES G. *and others, eds.* Classified Library of Congress subject headings: volume I: classified list. New York: Dekker, 1972. $25.00. 250 pp. (ISBN 0 8247 6020 4)

The Library of Congress *List of Subject Headings* suggests LC classification numbers for the headings given. The purpose of the present volume is to list all these numbers in classified order and to enter alongside all the subject headings —plus subheadings and sub-subheadings—bearing those numbers in the seventh edition of the *List*. Additions and changes made in the eighteen months following its publication in 1966 are also included.

The defects of the traditional American dictionary catalogue in a large library are increasingly recognized, but recataloguing a multi-million-volume collection would be prohibitive in time, cost and effort. However, with the present volume and its partner, users of a library employing the LC Classification for shelf arrangement will be able to follow the classification scheme and relate it to the subject headings in the catalogue.

The work begins with essays by each of the three editors describing the creation of the list and the relationship between LC classification numbers and subject headings. There follows the classified list in which any terms with more than one class reference appear against each appropriate class number.

This volume will be complemented by a second, consisting of an alphabetical list of the subject headings to be found in the first volume, together with their respective class numbers.

SCIENTIFIC BOOKS,

LIBRARIES AND COLLECTORS

3rd edition by

John L. Thorton & R. I. J. Tully

Scientific publications and their patrons from before the start of printing to the present. An outstanding 85-page bibliography is complementary to a fine piece of scholarly research.

£7 (£5.60 to L.A. members)

THE LIBRARY ASSOCIATION

FIRST for carpets
Dodson Bull

UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display

In our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 68402
BRISTOL: 2-3 Royal London House, Queen Charlotte St BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 496 London Rd SS0 9LG.
Tel: Southend 48569
9.00–5.30 Mon.–Fri. Sat. 9.00–12.00 (Manchester 9.00–4.00)

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of {specific / recent} information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

Cost Benefit Analysis and Public Investment in Transport: A Survey

Hanspeter Georgi

A survey which brings together the latest developments in the area of investment appraisal, considered in relation to the transport sector, where some of the most important advances in cost benefit analysis have been made. This is the first of the new **Transport and Regional Economics Series.**
1973 206 pp., illustrated 0 408 70428 4 £5.00

Dictionary of Economic Terms 3rd Edition

Alan Gilpin, BSc (Econ), CEng, MInstF, FIPHE

Many terms relating to new developements in economics have been incorporated into this new edition, which includes material on industry, marketing, banking, insurance and current affairs.
1972 236 pp., cased 0 408 70420 9 £4.00
limp 0 408 70421 7 £1.95

Information Systems

B. C. Vickery, MA, FLA

Each of the apparently diverse areas of publishing, librarianship, bibliography, documentation, records management and archives is treated here as a form of information system, so that the key aspects of a 'systems' approach to the processing of documentary information may be easily grasped.
1973 360 pp., illustrated 0 408 70456 X £6.00

On Documentation of Scientific Literature 2nd Edition

Th. P. Loosjes

This second edition, extensively revised, will be widely welcomed by librarians, publishers, information scientists and all whose work involves the communication of information. The book gives a concise theoretical background for all aspects of documentation.
1973 196 pp., illustrated 0 408 70429 2 £4.50

Use of Earth Sciences Literature

Edited by D. N. Wood

An up-to-date and reliable guide to primary and secondary sources of knowledge, this will be an invaluable reference work for librarians, for research scientists and for students of librarianship and of the earth sciences.
1973 440 pp., illustrated 0 408 70448 9 £7.50

Obtainable from leading booksellers or

The Butterworth Group

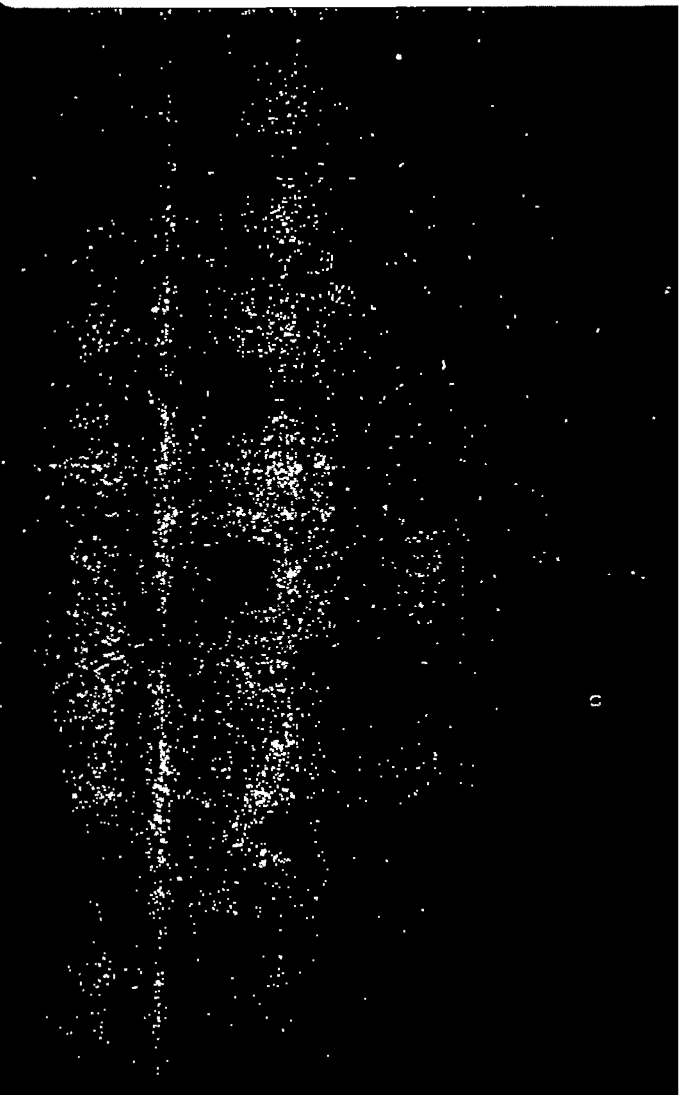
88 Kingsway, London WC2B 6AB

Showroom and trade counter: 4-5 Bell Yard, WC2

10 AUG 1973

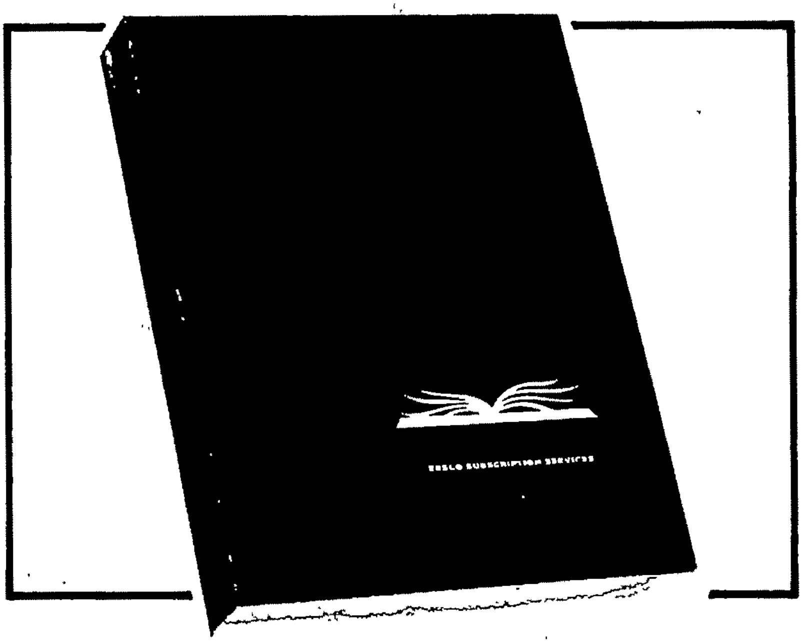
Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib Proceeding



MAY 1973
VOL. 25, NO. 5

ORDER NOW



LIBRARIANS' HANDBOOK

$8.00 PER COPY U.S.A., CANADA, MEXICO
$8.50 PER COPY OVERSEAS
(FREE TO CUSTOMERS OF EBSCO SUBSCRIPTION SERVICES)

The 1973-74 edition contains over 60,000 titles. Periodicals, newspapers, annuals, monograph series, continuations, and anything else definable as a serial is included; coverage includes serials from all nations. Price at print time, frequency, volume number information, and nation of origin are included for each title. A description of editorial purpose and content is included for selected titles. All titles are categorized by subject in a separate subject category section. The 1973-74 edition is over 1,000 pages of uniquely useful information.

Send Check With Order To:

EBSCO SUBSCRIPTION SERVICES
Dept. JTS/LH
Box 1943
Birmingham, Alabama 35201-U.S.A.

EBSCO Industries, Inc.

Aslib Proceedings

VOLUME 25 MAY 1973 NUMBER 5

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for Contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double-spaced, single-sided, on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

Techniques for the measurement of cost-benefit in information centres

M. S. Magson

Information Manager, ICI Central Management
Services, Wilmslow, Cheshire

The value and profitability of information services can be quantified by using modern management techniques to generate numerical data. In this approach, programme budgeting derived from management by objectives exercises is used as a basis for preparing cost-activity and cost-function analyses, whilst alternative costs for maintenance of the programme are derived by applying some basic critical examination, activity sampling and work study principles. By difference, cost-related benefits are obtained for specific activities and functions.

The procedure does not indicate the true value of units of information *per se*, but ranking of the benefits immediately highlights economic and uneconomic operations.

Model analyses are described in detail, supported by a number of factual results. The dynamic nature of the system and its use as a management device are illustrated by a practical application in a real-life change situation.

Introduction

THE NEED for methods of measuring performance in information centres is reflected in the large number of papers devoted to this subject in recent years. A variety of means for attaching realistic cost elements to units of information, or information services, has been proposed. Many of these have been reviewed by Landau,[1] who has also summarized the essential features of cost-reporting procedures. Methods of analysing services, and measuring cost data in respect of each component, have been suggested by Helmkamp.[2] However, the measurement of operational effectiveness, or benefits accruing from services, has proved to be more difficult. The difference between cost-effectiveness and cost-benefit, which are sometimes confused, has been explained by Lancaster,[3] who also lists the basic requirements for each type of analysis.

Until recently, attention has been directed to the measurement of cost-effectiveness: that is, evaluation of the efficiency of a centre in meeting its objectives or supplying stated requirements. However, early in 1972, an attack on the problem of carrying out cost-benefit analyses was made by Mason[4] in a paper describing a quantification technique used in the Library and Information Services of a large industrial organization.

Adopting the principle of programme budgeting, Mason allocates costs to the centre's stated objectives, calculates the alternative costs of achieving the same objectives if the central service did not exist, and obtains a benefit figure by difference.

We have applied and extended this approach in carrying out a more detailed cost-benefit analysis of a smaller information unit specializing in the fields of management science and computing technology.

In doing so, we have applied several concepts and techniques associated with these disciplines, for example management by objectives, basic work measurement, activity sampling and critical examination. The latter technique has proved to be highly effective for data-raising purposes. It has been discussed in depth by Raybould and Minter[5] and there is a good account by Fields.[9] Similarly, the use of a computerized project accountancy system[6] greatly facilitated the collection of current operating costs.

This paper describes the methods used, illustrated by a simplified model format, and gives factual results obtained in the course of two studies carried out during 1972. The results demonstrate the use of the analysis procedure as an ongoing or dynamic system, capable of application as an improvement mechanism.

Principles of the method

In applying the analytical techniques to a model Information Unit, three basic principles are followed:

(1) Evaluation is concerned only with information processes or systems and is based on comparative mechanisms of communication. The value of individual items of information such as bulletins, catalogues, abstracts, etc., cannot be quantified by this system, although measures of their effectiveness are necessary.

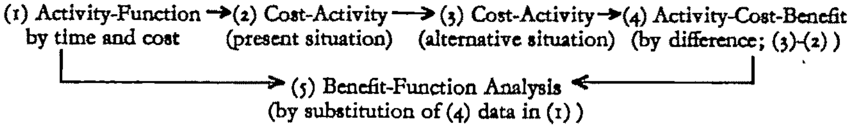
(2) It must be established that all activities are regarded as essential in the first place, otherwise they would not be carried out. Thus, if any activity should not be operated by the Information Unit, that information process would of necessity be conducted by other means, which must be defined and quantified. The difference between present and alternative operating costs represents the 'benefit'.

(3) Since the benefit figure is obtained by difference, it follows that, in certain cases, zero or negative values may be obtained. The significance of such values must be assessed in relation to the associated activity, and may be acceptable. However, it is important to bear in mind that, in this approach, a benefit of zero does not imply that the activity is of no value, but that the alternative procedure could be adopted at no extra cost. In this eventuality, a choice may be made on the basis of unquantified factors such as 'convenience', 'security' and 'general preference'.

Types of analysis

The final cost-benefit analysis is based on the difference between two sets of cost analyses, representing a 'present' and 'alternative' situation respectively. As a starting point, it is convenient to prepare an Activity-Function table, indicating the time spent on different activities by members of the Unit staff. These times can then be converted into cost figures and other costs added, the figures then being combined in a Cost-Activity Analysis (Present Situation). A Cost-Activity Analysis for the alternative situation is then prepared and the benefit calculated in each case. Finally, the quantified benefit may be substituted in the first Activity-Function table as discussed later.

The sequence may be represented by the following five stages of Analyses:



As will be seen in the examples that follow, a standard matrix format may be used throughout, in which all activities listed on the left of a grid pattern remain constant.

Stage 1: Activity-Function Analysis

A convenient starting point for the first stage is to carry out a critical examination of all Unit activities, answering the questions Who? (does) What?, Why?, When?, Where?, How? Traditionally, the examination goes on to ask 'should there be more, same, less than?' etc., but for our purposes, we may ask How/Where? (at present) and How/Where? (otherwise). This leads to the definition of alternative processes as illustrated later.

When? may be taken as How long? and the answers incorporated in a matrix defined by Who? and What?

The answers to What? should form a complete breakdown of all Unit activities and may possibly consist of a list of Unit objectives, if a Management by Objectives exercise is carried out. We have found that MBO is a valuable feature of the analytical system, since the criterion Why? is answered in all cases and the basic principle (2) is satisfied.

Plotting these What? activities (objectives) against Who? (individual members of the Unit) provides the Activity-Function grid, in which the appropriate effort figures are entered.

We have found it most convenient to record effort data in man-year units, assuming that one man-year is equivalent to two hundred man-days of available effort. This facilitates calculations, although the actual full man-year may be of the order of 230-240 man days. The difference may be accounted for by special duties, visits, sickness, travelling, training, etc., and this excess time is ignored in our analyses, since alternative in-Company procedures would probably bear an equivalent proportion of such time. Where the alternative is dependent on external sources, however, some adjustment may be necessary.

Similarly, the total cost produced by the analysis will be lower than the Unit budget figure and a reconciliation will be necessary. In a small Unit, such differences are relatively small and may be ignored or justified but in other circumstances it may be preferable to work on the actual man-days per annum figure.

In our exercise, effort data was compiled using a computer system of ICI origin—'PACT' (*P*roject *A*ccounting by *C*osts and *T*ime).[6] Unit objectives were coded and staff recorded the number of man-days spent on their activities using a special input form. Measures were accurate to the nearest tenth of a man-day (forty-five minutes). Returns were made weekly and after processing, print-out summaries analysing the distribution of effort over any required period were made available. In this way, it was possible to build up a complete record of the

Unit functions over several months and data representative of the full year was then transferred to the Activity-Function matrix.

Table 1A illustrates a specimen matrix in which arbitrarily designated services are plotted against individual functions A–F; the latter codes representing, for example, Unit Manager (A), Information Officer (B), Assistant Information Officer (C), and other staff (D), (E) and (F). It will be noted that activities of a similar or associated nature may be grouped together for analysis purposes. This presentation also allows maintenance activities to be grouped with production or service activities in the same area, thus facilitating calculation of group benefits, as explained later.

TABLE 1A: *Activity-Function Analysis by Time (Effort in man-years)*

ACTIVITY/GROUP	FUNCTIONS						ACTIVITY TOTALS	GROUP TOTALS
	A	B	C	D	E	F		
1.0 *Literature Production*								
1.1 Booklets		0.05	0.20				0.25	
1.2 Catalogues			0.05				0.05	
1.3 Bulletins					0.30		0.30	
1.4 Directory			0.10				0.10	
1.5 Accessions Lists				0.10		0.05	0.15	0.85
2.0 *Library Service*								
2.1 Internal		0.10		0.40			0.50	
2.2 External				0.30			0.30	
2.3 Maintenance				0.20			0.20	1.0
*Sections 3–10 omitted. See note.**								
11.0 *Special Documentation*	0.25		0.05				0.30	0.30
12.0 *Administration*	0.10	0.20					0.30	0.30
TOTALS	1.00	1.00	1.00	1.00	1.00	1.00	6.00	6.00

* The above table is a simulation of that compiled in the course of our analyses. The central section is omitted for reasons of brevity, but it may be noted that our original covered twenty-six specific activities arranged in twelve groups. Sections 3.0 to 11.0 covered, for example, reports service, technical enquiries, corporate activities, consultancy and the production of a special index. Other areas associated with information work might include abstracting and SDI services, patents and translations, special retrieval processes, etc.

Next, using the framework of Table 1A, the corresponding effort costs are calculated and substituted for the man-year figures.

These costs are calculated from each individual salary, adjusted on the basis of two hundred man-days of available effort. Thus, if the annual salary is £2400 (i.e. £10 per day actual), the figure becomes £2000 on a 200-day basis at the same daily rate.

Manpower costs can now be readily calculated from the effort data using reconciled salary scales, for example:

0.10 man years at £2000 p.a. = £200
or, 0.10 man years = 20 man days at £10 per day = £200.

In Table 1B, the following arbitrary salary scales have been used to convert the data in Table 1A.

A £4000 p.a. = £20 per day
B £3000 p.a. = £15 per day
C £2000 p.a. = £10 per day
D £2000 p.a. = £10 per day
E £1500 p.a. = £7.50 per day
F £1000 p.a. = £5 per day

TABLE 1B: *Activity-Function Analysis by Costs*

Costs in £

ACTIVITY/GROUP	FUNCTIONS						ACTIVITY TOTALS	GROUP TOTALS
	A	B	C	D	E	F		
1.0 *Literature Production*								
1.1 Booklets		150	400				550	
1.2 Catalogues			100				100	
1.3 Bulletins					450		450	
1.4 Directory			200				200	
1.5 Accessions Lists				200		50	250	1550
2.0 *Library Service*								
2.1 Internal		300		800			1100	
2.2 External				600			600	
2.3 Maintenance				400			400	2100
Sections 3–10 omitted. See note to Table 1A.								
11.0 *Special Documentation*	1000		100				1100	1100
12.0 *Administration*	400	600					1000	1000
TOTALS	4000	3000	2000	2000	1500	1000	13500	13500

Stage 2: Cost-Activity Analysis—present situation

The foregoing tables are now summarized and combined as displayed in Table 2. Activity totals are now tabulated in terms of both effort and costs, and a third column is added, in which associated costs are entered. These may be printing costs associated with literature production, rental or purchase of equipment, computing costs, purchase of books and services, subscriptions, etc. However, it is unnecessary to enter associated costs if it is known that these would be maintained as a matter of routine under the proposed alternative system.

For the same reason, effort costs are based on actual salary excluding overheads; that is, it may be assumed that the same functions, carried out by others in the the same organization, would bear equivalent proportions of overheads so that these factors effectively cancel out, unless the cost difference is very large.

TABLE 2: *Combined Cost-Activity Analysis—present situation*

ACTIVITY/GROUP	COSTS			
	Effort (*man-years*)	*Effort* (£)	*Associated* (£)	*Totals* (£)
1.0 *Literature Production*				
1.1 Booklets	0.25	550	50	600
1.2 Catalogues	0.05	100	100	200
1.3 Bulletins	0.30	450	125	575
1.4 Directory	0.10	200	100	300
1.5 Accessions Lists	0.15	250	50	300
SUB TOTALS	0.85	1550	425	1975
2.0 *Library Service*				
2.1 Internal	0.50	1100	—	1100
2.2 External	0.30	600	—	600
2.3 Maintenance	0.20	400	—	400
SUB TOTALS	1.00	2100	—	2100
Sections 3–10 omitted. See note to Table 1A.				
11.0 *Special Documentation*	0.30	1100	200	1300
12.0 *Administration*	0.30	1000	—	1000
TOTALS	6.00	13,500	825	14325

It should be noted, however, that where the alternative involves the use of an external contract or 'bought-in' services, the appropriate overhead figure and/or associated costs should be included for the 'present' activity.

Stage 3: Cost-Activity Analysis—alternative situation

As indicated previously, critical examination techniques used in the analysis of a 'present' situation may be applied to define the most probable alternative processes.

Taking each activity in turn, we may ask how the (mandatory) objectives are to be maintained *assuming that the Information Unit did not exist.*

Most of the activities are concerned with the acquisition, generation, processing and transmission of data and thus are dynamic processes which may be linked with (static) maintenance aspects where necessary, and considered as a whole. In this situation, the answers to the questions Who (else)?, Where?, How?, When? (i.e. How long?) form the framework for the alternative situation analysis.

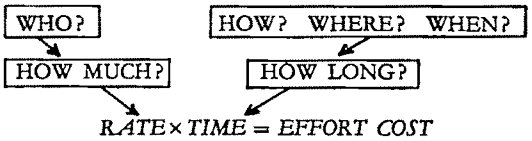
Answers to the question Who (else)? appear to fall into four categories:

(1) External commercial services, by spot purchase or contract.
(2) Suitable nominees in the same Department/location, e.g. secretaries, clerical staff, etc.
(3) Appropriate Company staff at different locations.
(4) Nobody. Users would obtain information directly, from the best sources, on a 'need-to-know' basis.

In category 1, quantification of alternative costs presents no difficulty as the appropriate figures can be obtained by quotation or the experience of other users. Generally, such resources may be apparently uneconomic in comparison with in-house services, but they may represent the only viable alternative.

However, in this case, the 'present cost' comparison should include normal overheads and associated costs for the appropriate activity, which will tend to reduce any apparent cost disparity.

In categories 2–4 the alternative mechanism demands identification of the people involved and measurement or estimation of their effort contribution. Having determined the time elements, these can be converted to cost figures by applying the appropriate salary rate. The procedure may be illustrated as follows:



In practice, we have found that the best procedure is to carry out a detailed analysis of each activity (present and alternative) before summarizing and transferring the resulting data to the cost-benefit matrix, at Stage 4 of the system.

Examples of such analyses, illustrating typical situations which might arise in categories 1–4, are given below.

Example:

Activity 1.4: Production of staff directory

Essentially, this is a high-grade clerical function carried out by 'C'. It involves updating the information on personnel and the organization (including functional and management responsibilities); also revising locations and telephone numbers as appropriate, at six-monthly intervals. Information may be supplied automatically or obtained by enquiry. The activity embraces arrangements for typing, specifying layout, proof correction and organizing printing and distribution.

Present costs

(i) Effort:

0.10 man years = 20 man days @ £10 per day = *£200*

(ii) Associated (Production) Costs:

Typing, printing, collation, binding = *£50 per issue*
(materials plus labour, excluding overheads)
= *£100 per annum* (2 issues).

Overall cost excluding effort overheads = *£300 p.a.*

Overall cost including overheads at (say) 70 per cent = *£510 p.a.*

Alternatives

(a) *Transfer responsibility to Administrative clerk.* Investigations show that the activity could be undertaken by a senior clerk in another (administrative) section. The salary rate in this case is slightly higher, at £12.50 per day.

Sample measurements indicate that the job would take twice as long as at present for the following reasons:

(i) Conflict with other duties, interruptions and imposition of higher priorities causes considerable dislocation of the work flow.
(ii) Lack of central contact facility and reduced knowledge of planned movements or changes demands more effort devoted to interrogation and data capture.
(iii) Marked reduction in proof-reading skills—more effort applied to checking and correction.

Alternative cost (a)

(i) Effort:
0.20 man years = 40 man days @ £12.50 per day = *£500*
(ii) Associated (Production) Costs:
As in the 'Present' case, excluding overheads = *£100 per annum*
Total = *£600 p.a.*
Net Benefit (a) = *£300 p.a.*

(b) *Use external (commercial) resource.* It is known that a local organization—Directory Services Unlimited—will undertake complete responsibility for production of this item, including collection of data from existing contacts, typesetting, checking, printing and distribution. Thus the whole operation could be 'farmed out' if necessary or desirable.

Alternative cost (b)

£400 per issue (all-in quotation) = *£800 per annum* (2 issues).
Deduct present costs *including* overheads = *£510 p.a.*
Net Benefit (b) = *£290 p.a.*

Interpretation

Clearly, in this case, there is little to choose between the two alternatives and in the ensuing cost-benefit analysis (Table 4), it is assumed that alternative (a) is preferred, hence associated production costs are ignored. In similar analyses where a number of alternatives are possible, selection of the appropriate benefit figure would depend on the range of disparity. For example, if three alternatives produced benefits of the same order, say within 10 per cent of the average, it would be reasonable to use the average figure. However, if in one case the benefit figure was relatively small, that is, if the alternative cost was very much closer to the present cost, then that procedure would be selected automatically as it would represent the most probable alternative in practice.

Example:

Activity Group 2.0: Technical library service

In the analysis, we postulate an activity group covering the maintenance and operation of a small technical library, with associated enquiry facilities. The library itself is a sub-unit of a main library centre at Head Office some two hundred miles distant. Purchase of books, subscriptions to journals and other expenditure of a capital nature is debited to the main library account, so that the actual operating cost is based on salaries only. The total effort comprises 0.9 man-years by a full-time librarian ('D'), plus a small contribution (0.10 man-years) from the senior 'B' in respect of specialist technical enquiries, amounting to 1.00 man years for this activity group. (N.B. If the library budget included the purchase of books, journals, etc., it would probably be unnecessary to record this expenditure as 'associated costs' since, in the alternative situation, such expenditure would continue in one form or another, in order to meet the needs of the Department.)

The service under discussion is available both to Departmental staff and to numerous other centres throughout the Company. In the following analysis, we calculate costs and benefits in each of these spheres of operation, but it is emphasized that the two service areas do not operate in isolation and are entirely interdependent. Similarly, each activity demands a basic maintenance effort, without which an efficient service could not be provided, but which would not exist by itself. Such maintenance effort encompasses normal library housekeeping routines, for example, filing and displays, local indexing, cataloguing and updating of holdings. Thus the background effort is identified as a base cost element, but is taken in conjunction with the service assessments when quantifying the benefit.

Present costs

2.1 *Provision of internal (departmental) service*

0.40 man years of effort by 'D' = 80 man days @ £10 = *£800*
0.10 man years of effort by 'B' = 20 man days @ £15 = *£300*

£1,100

2.2 *Provision of external (company) service*

0.30 man years by 'D' = 60 man days @ £10 = *£600*

2.3 *Maintenance effort*

0.20 man years by 'D' = 40 man days @ £10 = *£400*

Total = 1.0 man years = £2,100 per annum

When eventually calculating the benefit from the present service costs, maintenance costs are added to those of the two service areas in proportion to the effort involved.

Thus the effort ratio of activity 2.1 to activity 2.2 is 0.50:0.30. The maintenance cost is then divided in that ratio (5:3), giving 5/8 × £400 = £250 allocation to activity 2.1 and 3/8 × £400 = £150 allocation to activity 2.2.

In the final cost-benefit analysis, 'present' costs of the two service areas will thus become £1350 and £750 respectively. This step is essential since, in the alternative situations, no Unit library (and therefore no maintenance) would exist; accordingly, alternative costs are compared with fully costed service elements, incorporating the maintenance feature, in the 'present' situation.

Alternatives

Because of their highly specialized nature, these services could not be maintained by other staff on site, nor by means of commercial facilities. The only viable alternative is that of category 3—provision of the service by equivalent staff at another centre, however difficult this may be to operate in practice. In this case, we assume that the other centre would be the main (Head Office) library. The services would be operated by appropriate staff at that Centre, who tend to be of higher grade and the appropriate salary rate is found to be, say, £3000 or £15 per man day. Arbitrarily, we will use the same figure when estimating the additional time (and costs) incurred by Departmental staff when making enquiries at this remote centre.

Alternative to 2.1—provision of service to the department

Here, costing of a feasible alternative system is based on the types, numbers and processing times of enquiries normally handled under the present situation. It may be argued that some services are routine, for example, circulation of journals, and would incur the same amount of effort at another centre (disallowing transit time). However, experience shows that the major time element is not spent on the routine mechanism of issue but in dealing with specific enquiries concerning published or collected information. Such requests may be for the loan or purchase of books, for photocopies of certain articles, for various references, or for searches of archive material, but all may be regarded basically as enquiries. These may be grouped according to subject area or commonality and recorded over a period of several weeks, enabling the annual 'turnover' and average processing times to be determined for each type.

Processing times need not be measured with precision and a simple grouping into the time scales 'short', 'medium' and 'long' would suffice. 'Short' could represent enquiries completed in less than twenty minutes, 'medium' in less than one hour and 'long', over one hour. This type of subdivision is used in the tabulation that follows, although grouping by class might be preferable if each area is distinctive.

(It may be noted at this point that no attempt is made to quantify the benefits achieved by offering a browsing facility in the present situation, which vanishes under the alternative arrangement.)

Each individual enquiry is composed of three basic elements: 'Define', 'Search' and 'Respond'.

'*Define*' represents the specification of the item of information required and is quantified by the time taken to receive and note the essential details of the request.

'*Search*' represents the time taken to find or obtain the item requested, whether from the main library shelves, from another organization, or by reference to another party.

'*Respond*' covers the time needed to despatch a book or journal, to photocopy and mail an article, to give the required information verbally or by letter, perhaps to query the item, and to record the response.

However, in the alternative situation, a fourth element must be added—'Locate'. This represents the additional time taken for the enquirer to make contact with the appropriate person at a distant location. The 'Locate' element therefore depends on a number of factors—the speed and efficiency of the communication system, whether one person or several staff would handle the range of enquiries, and so on.

Similarly, the service staff at the distant centre will incur some time penalty in re-establishing contact with the enquirer. Normally, this would be expected to be less than the original 'Locate' element, as a degree of contact has already been established, but it would still be significant, particularly if verbal response or special despatch arrangements were required.

As mentioned previously, it is necessary to log the total processing times for different types of enquiry over a reasonable period, from which the data can be extrapolated to given an annual return. At the same time, sample measurements can be carried out to determine the average values for the 'Define', 'Search' and 'Respond' elements and when enquiries are referred to the distant centre, meaningful data relating to the 'Locate' element can be assembled. With the co-operation of the distant centre, equivalent processing times can be recorded for such referred enquiries, giving typical figures for the alternative 'Search' and 'Respond' elements at that centre. Specimen figures are shown in Table 3.

TABLE 3

	AVERAGE TIME ELEMENTS IN MINUTES				
	Locate	*Define*	*Search*	*Locate/ respond*	*Total processing time*
Present Situation					
Short enquiries	—	5	5	5	15
Medium enquiries	—	5	20	10	35
Long enquiries	—	10	60	20	90
Alternative Situation					
Short enquiries	10	5	10	10	35
Medium enquiries	10	5	40	15	70
Long enquiries	10	10	100	25	145

In the above tabulation, it will be noted that the postulated 'Search' elements are increased for a distant location. This effect can arise from a lack of day-to-day contact and experience in a particular environment; also, unfamiliarity with the related disciplines, literature, indexing terms and appropriate external information sources. To a great extent, the magnitude of the difference will depend on the existence of corresponding operational experience at the distant centre—if such experience already exists, the search times may be only marginally greater. Clearly, no universal data can be presented and individual measurement or estimation is essential. The figures given here are intended to be representative of a hypothetical case in which there is little experience of the 'present' operations at the alternative centre, hence searching factors may be expected to increase by up to 100 per cent.

The next step is to convert the number of enquiries per annum recorded for each area into effort figures (man-days) for example:

Suppose there are 1500 'short' enquiries per annum. At 15 minutes each, the effort = 22500 minutes = 375 hours.

At 7.5 man hours per man day, this equals 50 man-days of effort.

Results are shown in Table 4, the enquiry count in each case being representative of a measured value.

It is assumed that, in the alternative situation, the current rate of enquiry would be maintained and addressed to the distant location, although in practice some fall-off would be expected. However, this effect cannot be quantified and is ignored here.

TABLE 4

Enquiry area	*Number of enquiries per annum*	PRESENT SITUATION		ALTERNATIVE SITUATION	
		Average process time (mins)	*Current service effort (man-days)*	*Anticipated process time (mins)*	*Alternative effort (man-days)*
Short enquiries	1500	15	50	35	117
Medium enquiries	500	35	39	70	78
Long enquiries	50	90	10	145	16
TOTALS	2050	—	99	—	211

Table 4 cross-checks with the calculation of present effort and costs given previously; that is, the total allocated effort is at present 0.50 man years = 100 man days; sufficiently close to the figure of 99 man days totalled above. As noted previously in this analysis, the alternative rate is £15 per man day, so that the alternative cost of operating the service is 211 × £15 = *£3165 p.a.*

Present cost including maintenance = *£1350 p.a.*

Net Benefit = *£1815 p.a.*

Alternative to 2.2—Provision of external (company) service

This activity differs from 2.1 in that enquiries are generated by other information centres located throughout the Company.

As in analysis 2.1, data may be collected by recording the numbers and types of enquiry and by measurement of the associated service effort. In the 'present' situation, such enquiries would be generally lower in number, falling into the 'medium'/'long' bracket, 'short' enquiries having been answered by the originator's own information services.

Considering the alternative situation, 'medium' and 'long' enquiries would probably be redirected to the main centre library, to other information centres in the Company, or to individual sources of expertise in the subject area.

Analysis of enquiry type should indicate the number of enquiries likely to be handled in these different ways. Quantification of the appropriate alternative effort is obtained by means of the techniques described in analysis 2.1; that is, by deriving or measuring alternative processing times, including the 'Locate' element where appropriate, multiplying by the appropriate number of enquiries and converting to man-days per annum. Then, applying the actual man-day rate, alternative costs can be calculated.

The final analysis summary might appear as indicated below:

Present situation

Total number of enquiries per annum = 500
Average total time per enquiry = 50 minutes
Effort = 0.30 man years = 60 man days
Cost = 60 man days at £10 = £600
Add maintenance factor (£150): Total = *£750 p.a.*

Alternative situation

Without the detailed description as presented in analysis 2.1, a summary tabulation might appear thus (Table 5):

TABLE 5

Alternative processing point	*Probable number of enquiries redirected per annum*	ALTERNATIVE PROCESS			
		Time per enquiry (mins)	*Effort (man-days)*	*Rate (£/day)*	*Cost (£ p.a.)*
Main Centre	300	80	53	15	795
Other Centres	150	100	33	10	330
Expert Sources	50	90	10	17.5	175
TOTALS	500	—	96	—	1300

Thus, for activity area 2.2, we have a net benefit figure of:

*£*1300 − *£*750 = *£550 p.a.*

Finally, a summary of the entire activity group may be prepared for ease of reference (Table 6):

TABLE 6: *Cost-Activity Analysis—Activity Group 2.0—(Technical library service)*

ACTIVITY	*Present effort (man-years)*	*Present cost £ p.a.*	*Alternative effort (man-years)*	*Alternative cost £ p.a.*
2.1 Provision of internal service	0.50	1100	1.05	3165
Proportion of maintenance effort (2.3)	0.125	250		
2.2 Provision of external service	0.30	600		
			0.48	1300
Proportion of maintenance effort (2.3)	0.075	150		
TOTALS	1.00	2100	1.53	4465

Total Net Benefit = £2365 p.a.

Evaluation of documentation services

So far, we have considered methods of quantifying alternative costs in categories 1–3; that is, in cases where the viable alternative to the present situation involves a transference of responsibility for maintenance of the activity. However, there is a fourth category—that a present service might be abandoned and users left to make their own arrangements for the capture of information. It seems that this is most likely to occur in the field of literature production.

Most information centres compile, edit and distribute various forms of literature, for example accessions lists, techno-commercial bulletins, new documents, reference pamphlets, abstracts, patent reviews, and so on. These documents tend to be disseminated widely at regular intervals and are regarded as an integral feature of the total service. It follows that, if the resources of a team of information specialists were not available, attempts might be made to continue production of some items by use of other resources, either internal or external. In this situation, calculation of alternative costs and benefit may be conducted as described previously.

However, if a critical examination reveals that the transfer of production resources is impossible, we require some method of evaluating the consequences of total abandonment of a publication.

In order to calculate the cost of this alternative, it is necessary to have some estimate of the actual worth of the information disseminated.

We have approached this problem by analysing the results of a number of questionnaires designed to provide data relevant to specific publications, for example, current awareness newsletters, a practitioner's bulletin and a semi-technical information document.

In each case, it was possible to identify a 'target' area within the total circulation, defined by the number of recipients who confirmed that each issue contained at least one item of interest. It was found that the actual target area varied considerably according to the type of document. Thus, for a general current awareness newsletter, distributed monthly to a very large readership, only about 17 per cent of the circulation were identified as 'targets'. On the other hand, a target return of over 90 per cent was established for the readership of the practitioner's bulletin (a document compiled by specialists for the information of others in the same work area). In the third case—a special-purpose semi-technical information document aimed at a fairly narrow readership band—the target figure was about 60 per cent.

Analysis of the questionnaire returns, coupled with records of specific enquiries arising from one publication, provided basic data on the worth of the information supplied, as defined previously. In this connection, the number of 'hits' was established for each document. We define a hit as an interaction between one specific information item and a reader, to such effect that the reader considers that he would have otherwise actively sought that item of information. This represents a variation on the action-hit concept discussed in a paper by Cawkell.[7]

The results were related to the number of relevant information items issued in the documents under examination and to the targeted readership, so as to determine the actual hit rate.

For the current awareness document, a single issue contained ninety-eight items of potential interest to thirty-nine people in the target area (compared with an actual distribution of 230 copies). Thus the number of potential interactions was $98 \times 39 = 3822$.

The appropriate number of hit reactions notified in this case was 268 (that is, 'hit' items × number of people hit). The hit rate in this case was therefore:

$$\frac{268}{3822} \times 100 = 7 \text{ per cent.}$$

Similar results were obtained for the other publications. Analysed over a twelve-month period the hit rate (calculated on targeted readership in each case) was 6.7 per cent for the practitioner's bulletin and 10 per cent for the semi-technical publication.

The lower figures related to documents which were being steadily improved at the time of measurement. Originally, they tended to be diluted by a little superfluous material, whereas the semi-technical publication was highly developed at the time of analysis. In our own assessments, we therefore accepted a rounded hit rate of 10 per cent as a representative figure for the defined types of published literature.

Although we use this figure in the following specimen analysis, we would not claim that it is in any way universal. Individual rates for specific publications should be established, but surveys are expensive and possibly an exchange of comparative data, relating to various publications and establishments, would be useful in this context. So far, literature searches have revealed very little supporting data apart from a return by Kegan of a hit rate of 15 per cent in respect of 'items useful by association', derived from a cross-company study in a research environment.[8]

Specimen analysis

In our examples, activity 1.3 relates to the production of bulletins by a person 'E'.

Suppose that three current awareness bulletins are published, varying in content and frequency of issue. Each document is analysed in turn and the results combined to form the total activity/alternative for that function.

Thus 'E' spends a total of 0.3 man years on the activity and for ease of calculation, we will assume that this consists of 0.1 man years = 20 man days on each bulletin. Associated costs are £250 per annum, including overheads, of which perhaps £80 is allocated to Bulletin No. 1. For Bulletin No. 1, we may have the following data:

Total distribution = 200
Targeted distribution = 100 (established by questionnaire)
Number of relevant information items per issue = 30
Number of issues per annum = 12

Thus the number of items distributed per annum is 360 and the number of potential interactions is 360 × 100 = 36,000 per annum.

On the basis of the foregoing arguments, we postulate a hit rate of 10 per cent; that is, 3600 hits per annum.

This figure may be taken as the number of enquiries that would be generated if the publication did not exist.

Now, by applying the critical examination technique to the contents of the bulletin, we may identify the potential response areas and obtain estimates or measures of the total time required to complete an enquiry. Results may fall into the categories 'internal-short' and 'external-long'. A well-designed questionnaire should also reveal the probability of the bulletin contents generating either of these types of enquiry.

For example, let us assume that, on average, 80 per cent of the information items could be otherwise obtained by short, local enquiries and that 20 per cent would require external reference and more detailed search.

Having previously applied the 'Locate', 'Define', 'Search' and 'Respond' elements to the potential sources of the information, we may have arrived at the average time elements:

Internal—Short = 10 minutes per enquiry
External—Long = 30 minutes per enquiry

Thus the total enquiry time associated with 'short' items is:

$$\frac{80}{100} \times 3600 \times 10 = 28{,}800 \text{ minutes} = 480 \text{ hours} = 64 \text{ man days.}$$

Similarly, for 'long' items, the alternative time is:

$$\frac{20}{100} \times 3600 \times 30 = 21{,}600 \text{ minutes} = 360 \text{ hours} = 48 \text{ man days.}$$

Total alternative effort = 112 man days.

Having assessed the average salaries of those likely to be alternative sources of the information, the above data can now be converted into alternative costs. If 'short' enquiries could be handled by those in the £7.5 per day bracket and 'long' ones by those in the £10 per day bracket, we have:

Alternative costs for Bulletin No. 1 = £480+£480 = *£960 p.a.*

This compares with the 'present' situation of:
20 man days at £7.5 per day = £150 p.a.+£80 p.a. associated costs = *£230 p.a.*

The calculation is now repeated for Bulletins 2 and 3. The results will, of course, vary according to the type of information disseminated. For example, high alternative costs, as in the worked example, are usually obtained for a centrally compiled, technically oriented document of interest to many people in scattered locations. Conversely, general information of purely local interest, distributed within one site area, would be accessible relatively easily and quickly in an alternative situation, so that the alternative costs might be only marginally greater.

In this example, we envisage a final tabulation as follows (Table 7). Using the various procedures applicable to this stage of the system, the entire range of activities is analysed and the summarized cost data are then transferred directly to the total cost-benefit analysis described in Stage 4.

Stage 4: Activity-Cost-Benefit Analysis

Having assessed the present and alternative costs for each activity and calculated

TABLE 7: *Cost-Activity Analysis—Activity Group 1.3 (Production of Bulletins)*

	PRESENT SITUATION			ALTERNATIVE SITUATION	
ACTIVITY	*Effort (man days)*	*Effort (£)*	*Associated costs (£)*	*Effort (man days)*	*Cost (£)*
Bulletin No. 1	20	150	80	112	960
Bulletin No. 2	20	150	120	60	450
Bulletin No. 3	20	150	50	35	350
TOTALS	60	450	250	207	1760

the benefit by difference, the results may be presented as illustrated in Table 8.

Three features of this tabulation may be noted:

(a) Unit management is presented as a negative benefit since it exists only to administer the services as presently provided. If the Unit did not exist, team management would be unnecessary, but a reduced management cost would be associated with any 'in house' alternative, estimated at 15 per cent of present costs.

(b) Benefit may also be expressed as a percentage of cost, which represents a 'return on investment' and which is more convenient for ranking purposes. Appropriate figures are given in the last column.

(c) Expression of alternative effort in terms of man-years is a useful feature, the difference between these figures and current effort levels indicating the additional resources required to maintain the stated objectives under the viable alternative situations.

Interpretation of results

From the data entered in the partly-structured table (Table 8), the percentage benefits are seen relative to individual activities and, as sub-totals, to each activity group. The full totals across the base line show that, for this particular model, a total benefit of 115 per cent is achieved for the entire Unit activities; that is, if the Unit did not exist, achievement of the desired information flows would cost at least twice as much as at present. Furthermore, the additional effort required would be of the order of 10.5 man years compared with 6.0 man years at present.

Note that in Table 8, the negative administration benefit is deducted when calculating the grand totals. If the figure is too large to be ignored, proportionate adjustment (based on actual effort contribution) may be made to the benefits calculated for each activity/activity group total.

From a full table of results, percentage benefits may be ranked in descending order to give a 'league table' indicating the rating of all activities in terms of return on investment. A line might be drawn under the 'league average', below which lower returns might be examined in close detail. For example, returns under 50 per cent benefit/cost, or approaching zero level, might merit some investigation of the usefulness of that activity in the face of competing demands for that effort.

TABLE 8: *Activity-Cost-Benefit Analysis*

ACTIVITY GROUP	PRESENT SITUATION			ALTERNATIVE SITUATION			
	Effort (man years)	*Effort cost (£ p.a.)*	*Associated costs (£ p.a.)**	*Effort (man years)*	*Cost (£ p.a.)*	*Net benefit (£ p.a.)*	*Benefit as per cent cost*
1.0 *Literature Production*							
1.1 Booklets	0.25	550	150	†	1500	800	114
1.2 Catalogues	0.05	100	—	0.08	175	75	75
1.3 Bulletins	0.30	450	250	1.03	1760	1060	151
1.4 Directory	0.10	200	—	0.20	500	300	150
1.5 Accessions lists	0.15	250	—	0.15	350	100	40
GROUP TOTALS	0.85	1550	400	1.46	4285	2335	120
2.0 *Library Service*							
2.1 Internal	0.50	1100+[250]	—	1.05	3165	1815	134
2.2 External	0.30	600+[150]	—	0.48	1300	550	73
2.3 Maintenance	0.20	[400]	—	—	—	—	—
GROUP TOTALS	1.00	2100	—	1.53	4465	2365	113
Sections 3–10 omitted.							
11.0 *Special Documentation*	0.30	1100	200	0.50	2000	700	54
12.0 *Administration*	0.30	1000	—	0.05	150	−850	—
TOTALS	6.00	13500	1000	10.50	31250	16750	115

* Entered when similar costs are not incurred in the alternative situation. Nominal overheads included.

† Assumed produced externally.

Similarly, the ranked list can be searched for correlations or commonalities and it may well emerge that activities which are of, say, a 'service' nature give returns on a markedly different scale than those in the literature production area.

Also, certain groups of activities may be grouped in sub-sets according to their purpose; for example 'Corporate' or 'Departmental' activities. Again, percentage benefits in these areas may be summed and compared if desired.

Presentation in the manner illustrated above is useful for management purposes, enabling the compiler to determine profitable and unprofitable activities and, in the latter case, to confirm and/or justify them, or to seek improvement as necessary.

Benefits related to unit functions

Table 1A gives a listing of Information Unit activities together with the proportions of individual effort (man years) devoted to them. Thus individual functions, or areas of responsibility, are defined and it is interesting to substitute the appropriate benefit, or proportions thereof, for each activity/effort in the matrix. In Table 9, this interpolation has been carried out and it will be seen that the vertical column totals now give an approximate indication of the contribution by each function. Where an activity benefit is unique to one person, the whole figure is substituted for the individual's effort. Where the activity is shared, the benefit may be allocated in proportion to each contributor's effort. In the latter case, the allocated figures are rough approximations, since the true individual contribution is dependent on salary level and the appropriate benefit should be recalculated on this basis if accuracy is required. However, simple proportionation gives an acceptable measure for the purposes of this exercise.

In assessing the results shown in Table 9, it must be stressed that the total figures obtained per individual do not in any way reflect that individual's performance, effectiveness or productivity. The table simply shows the distribution of total Unit benefit across each function, i.e. the results reflect the contribution of each range of duties allocated to and carried out by the persons involved.

TABLE 9: *Activity-Function-Benefit Analysis*

ACTIVITY GROUP	BENEFIT ALLOCATION (£ *p.a.*)						NET BENEFIT (GROUP TOTAL) (£ *p.a.*)
	A	*B*	*C*	*D*	*E*	*F*	
1.0 Literature Production	—	138	960	276	823	138	2335
2.0 Library Service	—	237	—	2128	—	—	2365
Sections 3–10 omitted.							
11.0 Special Documentation	585	—	117	—	—	—	700
12.0 Administration	−283	−517	—	—	—	—	−850
FUNCTION TOTAL	4020	3710	3662	2404	1652	1302	16,750
PERCENTAGE OF GRAND TOTAL BENEFIT	24.0	22.1	21.8	14.3	9.9	7.9	100

In the above model, the distribution pattern of function benefits across columns A–F gives an approximate correlation with the seniority, experience and salary levels of those involved. If the individual benefit is salary-related, returns are of the order of 110–130 per cent for B, D, E and F; A is lower than average at 100 per cent, perhaps due to the administrative content of these duties, whilst C shows an exceptionally high return at over 180 per cent. It is thus possible to isolate benefit 'earnings' in this manner, and to consider any anomalies which may be displayed.

In general, the cross-interpolation of benefit seems to be a potentially useful management device, indicating in Table 9 that the functional duties and benefit 'earnings' are appropriate to each individual's skills and experience. It is possible that this type of tabulation might be of assistance in decision-making, particularly when managing the effects of staff movements, changes in manning levels and adjustments to the range of activities made in response to changes in Departmental policy or requirements. However, in making such assessments of functional value, it is essential to bear in mind the invisible contribution of good teamwork and mutual support. These elements are unquantifiable but undoubtedly add substantially to the effectiveness of the Unit as a whole.

Factual results

So far, we have discussed the application of novel data-raising techniques in model situations, using arbitrary but not atypical figures to illustrate the tabulations and matrices.

We now append two sets of conclusions, summarizing the results of the two actual exercises carried out at ICI Central Management Services during 1972. These amply illustrate the need to regard this type of cost-benefit analysis as a dynamic system rather than a once-off exercise.

In the first analysis, completed in June 1972, a comparatively low benefit return was isolated for the Registry (correspondence filing) area. Almost at the same time, notification of staff changes in this area suggested that the activities be re-examined, when it was found that the introduction of new computerized indexing systems had progressively increased the rate of service response to such an extent that an unduly large proportion of time was spent on maintenance. It was thus possible for one person to carry out the function instead of two; consequently, it was decided not to replace one person who was leaving and to reorganize the pattern of work.

On recalculating the cost-benefit analysis for the new situation, considerable improvements were noted, as will be seen from the revised conclusions dated November 1972.

Results of first analysis—(June 1972)

(1) The total annual benefit arising from all activities associated with the Information Unit is 115 per cent, expressed as a percentage of current operating costs. That is, communication of essential information or provision of essential services would cost twice as much per annum if viable alternative procedures were adopted.

(2) The highest benefits are associated with literature production and

dissemination. In this particular area, the average benefit is 235 per cent, reflecting the low cost/high effectiveness of printed media in communication.

(3) The yield indicated in (2) compares favourably with the figure of 200 per cent reported as applicable to a larger information centre making extensive use of printed media.
(4) Of all literature produced or handled by the Unit, the highest benefit is afforded by production of the Computer Bulletin (391 per cent). This emphasizes the value of producing technical documentation specially designed to provide communication flows between several centres in the same operational field.
(5) Library and enquiry services as currently provided are justified in terms of the benefit achieved (121 per cent).
(6) Slightly lower, but nonetheless positive benefits are shown in the special services area (86 per cent).
(7) The area of least benefit is the Departmental Registry and Reports File (26 per cent), mainly arising from the high proportion of maintenance in support of service activity. At this level, adoption of the alternative system may be considered since costs would be of the same order.
(8) The total benefit is roughly divided between Company and Departmental activities, being slightly higher in the former area (137 per cent vs. 93 per cent).

Results of second Analysis (November 1972)

(1) The total annual benefit arising from all activities associated with the CMS Information Unit is now 134 per cent, expressed as a percentage of current operating costs, compared with 115 per cent prior to reorganization.
(2) The highest benefits are still associated with literature production and dissemination. In this particular area, the average benefit has increased from 235 per cent to 266 per cent.
(3) Of all literature produced or handled by the Unit, the highest benefit is afforded by production of the Computer Bulletin (unchanged at 391 per cent).
(4) Library, reports and enquiry services as currently provided are still amply justified in terms of the benefit achieved (121 per cent as before).
(5) Reorganization of the Registry function has increased the effective benefit from 26 per cent to 106 per cent.
(6) Slightly lower, but nonetheless positive benefits are shown in the special services area (95 per cent average vs. 86 per cent previously).
(7) The total benefit is roughly divided between Company and Departmental activities, being slightly higher in the former area (144 per cent vs. 122 per cent).
(8) Activity-Function-Benefit Analysis has proved to be a useful management device for assessment of the effects of change in individual duties or manning levels.

The current analysis shows a smoother pattern of contribution than before, with benefits more directly related to the duties of individuals.

Conclusion

Since the measurement techniques described in this paper are directed to functions and activities, it follows that they should be equally applicable to any type of information unit or service centre. Comparative results will reflect the profitability of various activities in relation to different organizations, structures and locations, rather than the usefulness of the information processed. Nevertheless, such data would be interesting for validation purposes and could yield evidence in support of Landau's suggestion (ibid) that a degree of commonality—sufficient for costing purposes—is likely to exist across different centres.

For example, the factual results quoted previously relate to the Corporate and Departmental services provided by a small, centrally-based Unit, providing specialist information in management science, computing technology and Company matters. However, some correlation was observed between similar types of activity in this Unit and in a larger centre specializing in chemical and technological literature.[4]

It must be accepted that methods of quantifying the ultimate benefit of information in terms of value to the user, or to a Company, are still undeveloped. When such methods become available, they may possibly be integrated with the analytical techniques described here, thereby providing a more accurate and comprehensive performance measurement system.

REFERENCES

1 LANDAU, H. B. The cost analysis of document surrogation: a literature review. *American Documentation*, 20, 302, Oct. 1969.

2 HELMKAMP, J. G. Managerial cost accounting for a technical information centre. *American Documentation*, 20, 111, April 1969.

3 LANCASTER, F. W. The cost-effectiveness analysis of information retrieval and dissemination systems. *J. Amer. Soc. Inf. Sci.*, Jan.–Feb. 1971, p. 12.

4 MASON, D. PPBS: Application to an industrial information and library service. *J. Librarianship*, 4, 2, April 1972, p. 91.

5 RAYBOULD, E. B. *and* MINTER, A. L. *Problem solving for Management*. London: British Institute of Management, 1972.

6 PACT feature of Computer Utilization Monitor (CUM-2), available through Will-Denn Resources Ltd, Rowhook, Nr Horsham, Surrey.

7 CAWKELL, A. E. Cost-effectiveness and benefits of SDI systems. *The Information Scientist*, Dec. 1972, p. 143

8 KEGAN, P. L. Measures of the usefulness of written technical information to chemical researches. *J. Amer. Soc. Inf. Sci.*, May–June 1970, p. 179.

9 FIELDS, ALAN. *Method study*. London: Cassell, 1969.

A Specialized Information Centre for high temperature processes

Margaret E. Brain, J. B. Livesey*†
and Alan Williams

The High Temperature Processes Information Centre established within the Department of Fuel and Combustion Science at the University of Leeds is described in regard to its aims, functions, coverage and future activities. *The High Temperature Bulletin* and other facilities, which include a photocopying service and an information retrieval system, are also described.

IN THE middle sixties the Office for Scientific and Technical Information (OSTI) set up various experimental specialized information centres. These specialized centres were to collect all relevant material within their subject areas and to disseminate it by various means, such as current awareness bulletins, bibliographies and reviews; and to provide an enquiry service to satisfy the information needs of individual research workers. Various criteria were set down for the establishment of these centres. It was stated that centres should cover subjects for which an information need had been established, where the original information came from a wide subject area and where the work was of scientific or technical importance. A further criteria was made that the centres should be part of or allied to research groups so that scientists should become involved in the work of the information centres.[1]

The subject of high temperature process was chosen as one in which to establish an information centre following a recommendation by a Science Research Council working party on high temperatures[2] that this subject area merited special stimulation. It was noted that the information needed was from a wide range of disciplines and it was reported that research activity in this field was likely to increase and a comprehensive information service would stimulate research. OSTI established two centres in the University of Leeds: the High Temperature Reaction Rate Data Centre within the Department of Physical Chemistry, which evaluates published kinetic rate data; and a Specialized Information Centre covering the subject of high temperature processes within the Department of Fuel and Combustion Science.

The Information Centre was established with a grant of £13,555 awarded by OSTI in October 1966. This grant was to cover the cost of establishing the Centre and its operating costs for a period of three years. Since the termination of the OSTI grant the Centre has been supported by the Gas Council, but as the circulation of the bulletin increases it is becoming more financially independent.

---

* Department of Fuel and Combustion Science, University of Leeds.
† Department of Librarianship, Leeds Polytechnic.

The functions of the Centre are defined as providing a service to scientists in the fields of combustion and high temperatures and undertaking research in information retrieval and dissemination. This involves building up a document collection, which now contains over twelve thousand items; and disseminating this material, three-quarters by means of a current awareness bulletin which is published bi-monthly and contains bibliographic citations and annotations of recently published work. The other quarter of the material has not been indexed in the bulletin since it is of pre-1967 origin. A follow-up service is provided by a photocopying service of all documents held in the Centre and cited in the bulletin. For a time an information retrieval service was provided in response to queries in the subject field, but this is no longer available since it proved to be uneconomic. A thesaurus, which is still available, had however been produced in conjunction with the retrieval system.

The first problem for the Centre was the definition of the subject area to be covered. The term 'high temperatures' means different things to different people; thus a fairly arbitrary minimum temperature of 1800°C was fixed. This single criteria for the relevance of the literature to the Centre, however, is not always sufficient. In certain areas of investigation such as plasma physics, high temperatures are attained, on paper at least, but such work is already covered by the *Culham Laboratory Library Bulletin* and so is excluded from the literature collected by the Centre.[3] The main subject areas covered are summarized in Table 1.

TABLE 1: *Main subject areas covered by the Centre*

Subject area	*Including*	*Excluding*
Flames and combustion	Fundamental flame studies (no temperature limit)	Atomic and cool flames, certain applications, fire research, combustion engines, and incineration of refuse
Arcs and sparks	All fundamental studies	Applied studies
Lasers	Fundamental studies at foci of laser beams and applications to welding and cutting	Theoretical and other studies
Plasma physics	Temperature measurement and diagnostic techniques only	
High temperature chemistry and materials	All studies of systems above 1800°C	Studies below 1800°C

At present the High Temperature Information Centre produces a current awareness bulletin, the *High Temperature Bulletin* originally called the *High Temperature Information Bulletin*. This was first published in November 1967, with an issue containing 180 references. The literature covered consists of journal articles, reports, conference papers and some theses. There is, however, no attempt made to include patents except when they are also issued as reports and appear in *Scientific and Technical Aerospace Reports*. Relevant articles for the Bulletin are obtained mainly by scanning *Current Contents: Physical and Chemical*

Sciences (journal articles), seventeen key journals obtained on automatic circulation from the National Lending Library for Science and Technology (journal articles), *Scientific and Technical Aerospace Reports* (reports, translations, theses), NLL *Announcement Bulletin* (British reports, translations, theses) and NLL *Index to Conference Proceedings* (conference papers). In addition, if time and personnel are available, *R & D Abstracts* (British reports) and *Government Reports Announcements* (reports) are scanned.

It was found in most cases that is was impossible to identify exactly those items which are relevant to the Centre without consulting the entire document. For this reason an article or an abstract of it has to be examined before being accessioned and as the article has to be obtained an annotation is included. Most documents referred to in the bulletin are normally obtained for checking from the National Lending Library for Science and Technology and in some cases reports are obtained from the Technology Reports Centre at St Mary Cray. The Centre is fortunately situated close to the NLL at Boston Spa enabling the staff to make frequent working visits.

The Centre attempts to cover a large percentage of the relevant literature in English, French and German. Some items are also collected in other languages, such as Russian. English translations of documents in foreign languages (particularly Russian) are collected and form a valuable part of the collection. The coverage by language of the bulletin is shown in Figure 1.

After collection the citations are typed on to index cards which are then assembled into pages which are photo-reduced and printed by offset lithography before being collated into the *Bulletin*. The *High Temperature Bulletin* is published bi-monthly and is currently available for an annual subscription of £10. The *Bulletin* is not issued until at least three hundred citations have been collected.

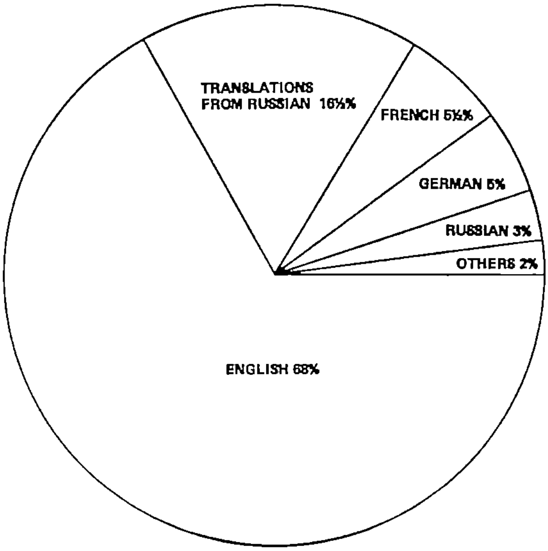


FIG. 1. *Characteristics of coverage of the bulletin: languages covered*

The literature is divided into twelve subject sections and the citations arranged in accession number order within each section. At the head of each section cross-references are given to relevant articles in other sections. Each entry consists of the title, the author, the citation and a brief annotation.

Most documents referred to in the *Bulletin* are retained in the Centre and form the basis of the High Temperature Collection. Documents themselves are collected by various means. If possible the author is contacted and a reprint is requested. This involves a not inconsiderable time-lag so that not all articles are available immediately. In some cases, especially for cover-to-cover translations, there is no address available even for the original, so these articles are photocopied. Some reports are held on microfiche but in other cases they are not held, but their availability is noted. Originally relevant books were purchased but on the termination of the OSTI grant this practice was discontinued, the availability of the publication being noted instead. If possible, preprints from conferences are kept but since 1969 whole conference proceedings in published form have not been kept. Of all the material indexed in the *Bulletin* 54 per cent is held by the Centre in the form of author's reprints or reports from the issuing organizations, 30 per cent as photocopies, 5 per cent in the form of purchased books, 4 per cent as microfiche, 2 per cent as references to reports held by the TRC. Five per cent of the articles indexed in the *Bulletin* are not held.

The Centre's documents are indexed by accession number, author and institution. The accession number index consists of the actual cards used in the production of the *Bulletin*. The institution file provides the names of firms and institutions working in the field of high temperatures, although sub-division as to type of organization or subject covered is not included.

The Centre operates a photocopy service as a back-up facility to the *Bulletin*. This service was introduced in June 1968 and subsequently the demand for this service has gradually increased. If a report requested is available only on microfiche from the NLL this is obtained and forwarded to the requester at its cost to the Centre. Where possible, every attempt is made to provide a photocopy when requested.

In January 1969 a question-answering service was established with a stock of about four thousand documents, the majority of which were indexed for subject retrieval. The major portion of these documents was keyworded by three part-time indexers working outside the Centre, with up to ten keywords. The system was established using an optical coincidence, post co-ordinate indexing system. A thesaurus was developed to guide the indexers and is still available as the *High Temperature Thesaurus*. Unfortunately, when the initiating grant from OSTI ceased, the keywording and punching had to stop at about 8,500 accessions in June 1971. During the period when the service was available, however, very few requests were sent to the Centre due, perhaps, to the fact that only the literature published since about 1967 was available for retrieval. Considering the limited use made of the service and the poor financial return, it was discontinued.

The present situation with regard to the Centre is that this year it has become financially self-supporting. The current circulation of the *Bulletin* is about 150 with 44 per cent going to academic libraries, 36 per cent to industry, 16 per cent to government research organisations and 4 per cent to the copyright libraries as legal deposit. The number of subscribers has risen slowly from the thirty-seven of January 1969, when a charge of £5 was introduced after a year of free provision.[4] The users of the *Bulletin* are world-wide, from Russia (2 per cent of the subscriptions) to the United States (18 per cent), most copies being sold in the United Kingdom (46 per cent). At the present time the Centre employs one part-time information worker and two part-time secretaries.

Work is now being undertaken on an evaluation of the High Temperature Processes Information Centre. The evaluation will consider the *Bulletin* in terms of precision, recall, novelty, i.e. how many new articles are notified to the users and how much effort is needed to discover these in terms of unit search time. The coverage of the *Bulletin* and its overlap with other services will be considered Although the information retrieval system has now ceased operation it will be analysed in terms of recall and precision.

Further considerations will have to be examined in relation to the concept of specialized information centres, the cost of the centres and whether any centre can produce a comprehensive service without the help of government grants.

Acknowledgments

The authors wish to thank OSTI for a maintenance grant (to MEB) and the staff of the Centre for their kind advice and criticism. The authors also wish to thank OSTI and the British Gas Corporation for their support for the Centre.

REFERENCES

1 OSTI POLICY III. 'Specialised Information Centres'. *OSTI Newsletter*, 1, 1967, p. 2.

2 Press release, OSTI, 30th Nov. 1966.

3 UNIVERSITY OF LEEDS. Department of Fuel and Combustion Science, Information Centre on High Temperatures. *Report on the year ending September 1967, presented to the Steering Committee at a meeting held 18th Dec. 1967.*

4 UNIVERSITY OF LEEDS. Department of Fuel and Combustion Science, Information Centre on High Temperature Processes. *Report on the period Oct. 1967 to Dec. 1968, presented to the Steering Committee at a meeting held on 20th February 1969.*

British Book Distribution: the bookseller's role and problems

D. H. Noble

Managing Director, Claude Gill Books

Paper presented at a Seminar on British Book Distribution held at Claude Gill Books, 24th October, 1972

APPROXIMATELY five years ago, when he retired, Mr Claude Gill delivered a paper to a conference of librarians and it was very clear that he was pessimistic regarding the standards of distribution from publishers to booksellers. After the traumas of early computerization and decentralization away from London and five years later, I think that there are now grounds for believing that the situation has improved for the better. It is not ideal. Many publishers are still too slow and too many mistakes are still being made. The Director of the Booksellers Association recently said that: 'In an outside world of increasing congestion and high labour costs it may be regarded as an outstanding achievement for a service nowadays to be no worse off!'[1]

I think though, from experience at Claude Gill Books, I would go further than this. Things have improved and there are grounds for thinking that they will continue to improve.

What is the bookseller's basic role? In the context of special library supply I believe it is to act as a filter between each of his customers and the 250,000 books in print, the 30,000 new books that are added each year, and the several thousand individual publishers who produce these books. A bookseller, in effect, acts as a wholesaler to the specialist librarian, whether the library is industrial or academic, governmental or institutional. The bookseller's skill and expertise must match the special requirements of librarians—skill in tracing a book, in obtaining it, and in getting it to where it is required—a skill which demands discipline and accuracy.

A few years ago a group of larger booksellers was formed within the Booksellers Association to enhance and improve the bookseller's role. This group was called the Charter Group and I would like to quote its Charter for better bookselling.[2]

1. To maintain the highest standards of bookselling.
2. To lay down minimum training requirements for management and staff with the aim of securing more efficient and knowledgeable service in Charter bookshops.
3. To encourage the development of well stocked bookshops for the customers' benefit and to emphasize to publishers the importance to them of good stockholding bookshops.

4. To give members advice and help in displaying and publicizing books.
5. To make efficient bookselling more profitable.

I bring this Charter to your attention because it is one of many ways in which the bookseller seeks to improve himself and by which he seeks to influence publishers, which in both cases are for the benefit of the customer, i.e. the librarian.

In this context there are five points I would like to bring to your notice:

1. The League Table, which is published in *The Bookseller*[3]
2. The Distribution Handbook[4]
3. Standardization[1]
4. The Charter Economic Survey[2]
5. The Book Trade Working Party Report[5]

First of all, let me tell you about the League Table. This is compiled about once a year by booksellers to show the factual position regarding publishers' deliveries. It is used by booksellers as both a stick and a carrot to show publishers what can be done in distribution and what has been achieved, using it as a spur and encouragement to the laggard.

For example, the Table published in *The Bookseller* on 16th September 1972 shows that Gollancz, at the top of the League, took five calendar days or three working days, based on an average of seven deliveries using either post or passenger train, to deliver to Hampshire. At the other extreme, Dent took twenty-seven calendar days or nineteen working days to deliver to the same bookseller. But if one looks at this Table carefully, only seven publishers at the bottom of the Table took ten or more working days to deliver. This is a fairly dramatic improvement over the previous Table when seventeen took more than ten days.

The disappointing feature about this Table from a specialist librarian's point of view is the poor performance of the major technical publishers—although McGraw-Hill, who used to be a laggard, are now in the top ten. It is interesting to note that, despite decentralization and the move of publishers away from London, the London bookseller in the survey still gets the fastest delivery, even though, in the case cited, all the orders were sent to a clearing house and not direct to the publishers concerned.

This Table has been a vital and valuable document in helping to analyse the true position regarding publisher's deliveries.

Secondly we come to the Distribution Handbook compiled jointly by the Booksellers and Publishers Associations and edited by Mr Lyndon Jones—'A simple guide to the best methods and procedures so as to improve the speed and efficiency of distribution.'[4]

First of all the Handbook shows that publishers and booksellers do talk to each other, contrary to widely held views that they do not, and secondly that they can communicate and co-operate sensibly in order to improve the health of book distribution.

My third point concerns standardization. The book trade is a diverse one—there are too many books, too many publishers and a lot of booksellers; consequently there are thousands of different types of booksellers' order forms, publishers' invoices and other forms of documentation. There has been an increasing momentum in the last few years to introduce standardization and there are now standards drawn up jointly by the Booksellers and Publishers Associations regarding standard layouts for order forms, publishers' invoices, and returns' procedures from booksellers to publishers. In an age of increasing mechanization and computerization, a disciplined approach to paperwork is essential. This approach must lead to simplification and standardization of procedures and, furthermore, cost savings.

Fourthly, we come to the Charter Economic Survey.[2] Every year the Charter Group of the Booksellers Association draws up a survey to clarify the position regarding the economic health of bookselling. It is a type of interfirm comparison which enables a bookseller to compare his economic position with other booksellers similarly placed, perhaps showing him where it is necessary to improve margins or return on capital or sales per square foot and so on; it is particularly helpful in drawing factual attention to publishers that all is not well financially. The two key ratios, trading profit as a percentage of sales and trading profit as a percentage of capital employed have both been declining for the past four years and this is made clear in the last Charter Survey. This is not good for the bookseller or the publisher and, not least, for the customer—the librarian.

The Charter Economic Survey is factual evidence supporting a dialogue between booksellers and publishers in an effort to improve business relationships. Unless this happens there will be fewer bookshops and those that remain will not provide the dynamic retail outlets which publishers need. I believe there has been an overall improvement in bookselling economic health, although this is not yet evident in the figures published.

Lastly I bring to your attention the Book Trade Working Party Report.[5] Two years ago a joint Publishers and Booksellers Associations' Book Trade Working Party was set up with an equal number of booksellers and publishers whose terms of reference were:

> to establish the economic requirements of a prosperous and continuing home book trade capable of ensuring the widest availability of all kinds of books to the potential book buying public.

Five booksellers and five publishers met over a period of two years and at the 1972 Booksellers Association Conference submitted the Book Trade Working Party Report containing their findings and recommendations. I will not go into them in detail. They came up with eight major recommendations, two of which covered topics close to booksellers' hearts—distribution and publishers' discounts to booksellers. Copies of the Report are available from the Booksellers Association or Publishers Association if any librarian wishes to see one.

I mention this Report because it further illustrates the initiative being taken by booksellers and by publishers, goaded on by booksellers, to improve the book trade and, above all, to improve distribution. There is no let up here and, in the words of the Director of the Booksellers Association '1973 will have to be a great year for trade evangelism'.[1]

I would like to turn now to the mechanics of distribution and, for this purpose, I have drawn up a simplified distribution chain:

AUTHOR
↓
PRINTER
↓
PUBLISHER
↕
BOOKSELLER
↕
LIBRARIAN
↕
USER

The author's manuscript is sent to the printer and distributed by the publisher to the bookseller who sends it to the librarian for immediate or future use by the ultimate reader.

Going the other way, the reader sends his demand to the librarian who orders the book from the bookseller who has to obtain it from the publisher.

I say it is a simplified chain because obviously the publisher is also linked to the author; also a bookseller will sometimes receive stock direct from a printer, and so on.

I would like to look closely at the middle part of this chain—the links between the librarian, the bookseller and the publisher and the links back again:

PUBLISHER
(2) ↑ ↓ (3)
BOOKSELLER
(1) ↑ ↓ (4)
LIBRARIAN

Let us look at stage 1, when a librarian sends an order to a bookseller. If speed is one of the criteria of good distribution then this order must be sent by first-class post on the day it is prepared. Some librarians order through purchasing departments causing delays right at the start. I would like to suggest that librarians in such a position negotiate blanket orders from their purchasing departments making themselves fully responsible for the preparation and despatch of orders. Preferably each title should be ordered on a separate form which can be as small as 5″ × 3″, although a slightly larger form is better. Such single orders can be dealt with more quickly than mixed orders, which may have to go to different shop departments to check against stock or to be subject to bibliographical work. Send the bookseller as much information as you have—author, title, publisher, edition, etc. The bookseller is always willing to obtain these details but they make an additional process and take time. If you know the SBN, quote it so that the bookseller can quote it on his order to the publisher. If you require a book urgently, telephone, although there is considerable congestion in central London and we would advise you to telex whenever possible. A bookseller will always try, within his ability, to obtain a book required urgently.

Stage 2 concerns the order in transit from bookseller to publisher. If the book is not in stock at the bookshop, an order should be sent to the publisher carrying full (typed) ordering information, on standard order forms or similar, by first-class post.

At stage 3 the order reaches the publisher and it is hoped that he sends the book to the bookseller as soon as possible. Booksellers do not expect unrealistic speed. More important, they require consistent delivery with the highest standards of accuracy not only regarding books but, also, answers concerning non-availability and so on correctly sent against the original orders.

Booksellers receive books in a variety of ways: British Rail; carriers; publishers' own vans; booksellers' own collectors; Publishers' Parcels Delivery Service. Although a number of publishers still deliver by their own vans in central London, this is rare outside the capital. Taking the country as a whole, Publishers' Parcels Delivery Service is now, probably, the most used method.

Stage 4 concerns the bookseller's despatch to the librarian. Again a high standard of accuracy is essential and it is vital that the librarian receives an answer if the book is not available. The librarian's company's own goods inward department is often a factor in delay. How fast a service do you have from your goods inward department? Do you receive your consignments on the day they are delivered? If the book is not to go to the library but elsewhere in the organization, have you given clear delivery instructions?

This stage in the distribution chain is sometimes split into two separate parts. Most booksellers carry stock and match orders against that first so that the link between booksellers and publishers may be quite separate from that of the bookseller and librarian:

PUBLISHER
↑ ↓
BOOKSELLER

BOOKSELLER
↑ ↓
LIBRARIAN

For example, if the bookseller has a book in stock then he will send it to the librarian without any contact with the publisher. Nearly two-fifths of Claude Gill's orders are supplied from shop stock. In our most specialized department, this proportion is as high as four-fifths or 80 per cent.

Quite separately the bookseller will order books for stock from publishers. These are new books or books already published which justify being kept on the shelves. They are kept in stock as long as there is a demand for them and as long as they do not fall below a certain stock turn—about five times yearly for specialist books, which means, on average, a book being available on the shelves if it sells within two-and-a-half months. Most of these orders to publishers are for quantities of many titles at a time, which makes good economic sense for bookseller and publisher alike. A bookseller wants to supply as much as possible from stock within his economic parameters in order to minimize expensive single-line, single-copy, ordering from publishers.

How long the various links in the chain take will depend on a number of variables—not least the various delivery times from publishers as shown in the League Table. I would like to speculate on the time cycle and to summarize ways in which this time cycle can be cut.

For example, any book supplied from the bookseller's stock will cut out the cycle of bookseller, publisher, bookseller. As we have seen from the League Table, a saving of between three and nineteen working days can be made here. If a librarian prepares his own orders, despatches them on the same day by first-class mail and receives the books the day they are delivered to his organization, another six days could be saved. Some of Claude Gill's customers devise their own ingenious schemes to speed books to their libraries. In one case we deliver to a librarian's husband who works in London. He takes the books back to her in Hertfordshire. The ultimate in speed is to establish which bookseller has a particular book in stock and then to collect it by messenger. This could cut the total distribution cycle in central London to, say, one hour!

I have given the background to what I believe is an improved distribution situation and also told you of the positive measures booksellers are taking in liaison with publishers. I have looked briefly at the distribution chain and, in conclusion, I would like to look ahead to the future.

Top managers in publishing will have an ever increasing awareness of the importance of distribution and, consequently, of the newer techniques involved. I believe that there will be greater professionalism among booksellers and that this professionalism will be rewarded more equitably so that bookselling will become economically viable and an adequate return on capital will be achieved.

Mechanization and computerization will be developed so that booksellers, generally falling under the heading of 'small businesses', will be able to afford more sophisticated techniques. I am sure that, within the next five years, we shall see visual terminals in bookshops capable of instant interrogation of publishers' files and enabling faster, more accurate ordering—and similar links between booksellers and librarians.

REFERENCES

1 DAVIES, G. R. A distribution handbook for the seventies. *The Bookseller*, 6th September, 1972, pp. 1690–95.

2 CHARTER BOOKSELLING, 1971. *Annual Report and Economic Survey of the Charter Group of the Booksellers Association*. London: Booksellers Association, 1972.

3 JONES, LYNDON. The latest League Table. *The Bookseller*, 3rd June, 1972, pp. 2440–42.

4 *Book Distribution: A Handbook for Booksellers and Publishers on the Ordering and Distribution of Books in the United Kingdom*. London: Publishers Association, 1972.

5 *Report and Recommendations of the Book Trade Working Party, 1972*. Available from Booksellers Association or Publishers Association.

Letter to the Editor

INFORMATION BULLETINS

Dear Sir,

It was a delight to see some attention paid to the humble, but to our mind invaluable information bulletin. However, Mr Whitehall's paper raises two points on which we would like to have your readers' opinions. For example, he suggests that (informative) abstracts reduce the requests for photocopies. It would be interesting to know if his correspondents accepted this as an *a priori* truth, or had any evidence to support this conclusion. It seems to us that abstracts are as likely to whet people's appetite as to satisfy it. This point is not academic. Our bulletin had a new editor in 1972 who introduced a primitive type of abstract. The average number of requests for photocopies promptly rose from 2.8 to 4.7 per item, i.e. by some 68 per cent. This clearly could be due either to his selectivity, or the introduction of primitive abstracts, or, more likely, both. The percentage of people requesting further information increased from 23 per cent to 48 per cent at the same time. On the face of it our evidence would appear to indicate fairly clearly that abstracts stimulate rather than sedate interest. Of course, being somewhat primitive, they tend to be indicative rather than informative, which may account for the implications being radically different from Mr Whitehall's findings.

We are not convinced that informative abstracts are, in fact, preferable to indicative abstracts, at least as far as current awareness is involved. Apart from anything else a bulletin of indicative abstracts gives a very useful indication of the state of the environment within which the organization is operating, whilst bulletins of informative abstracts contain so many trees of precise information that the overall pattern of the wood is lost.

The other point on which we would like your readers' comments is the question of redundancy, or items for which copies of the original item are not required. Clearly geographical influences will have a dominating effect, but we are surprised that a level of 66 per cent apparent noise is considered reasonable. Our own noise level of about 10 per cent I consider too low to give very great confidence in the adequacy of the coverage, in spite of the fact that the library is geared for post and telephone enquiries rather than callers. However, unless all our readers worked within twenty yards of the library we would go berserk if we only had requests for further information on 30 per cent of the items included in any issue.

Yours faithfully,

K. J. ILLING
Librarian
K. R. WILFORD
Bulletin Editor

British United Shoe Manufacturing Co. Ltd,
PO Box 88,
Belgrave Road,
Leicester, LE4 5BX.

BRIEF REVIEWS

ANBAR PUBLICATIONS LTD. 'The Compleat' Anbar number one. Anbar Yearbook 1 (to August '72). Wembley: Anbar Publications Ltd, 1972. 283 pp. £25. (SBN 900060 94 8)

This is a Compendium of Abstractes, being distillations of Bookes and Treatises concerning matters of the Art, Philosophie and Science of Management. The Compendium, which is to be had for the sum of 25 pounds, doth containe in one sequence some 3000 Abstractes taken from their originall publicacion in 200 Journalls. It is an annuall cumulation of that which hath appeared (Anno Domini 1971/1972) in four lesser Compendiums issued by the house of Anbar with the strange titles: Accounting and Data Processing, Top Management, Personnel and Training, Marketing and Distribution. For the conveniaunce of the scholar, an ingeniose path hath been devised to lead him through severall indexes to his desired Abstracte. Were he, by example, to have an interest in Bad Debts, he would find this phrase in alphabeticall order in a Register of Keywordes, against the numbers 3.17. In the Classification Framework the scholar would perceive that the notacion 3.17 doth represent Credit Control being but a parte of a larger subject Accounting Finance which hath the notacion 3.1. Thus encouraged, the scholar turns now to those Partes which do containe bibliograficall references. In the one Parte, called Index, he may find Journall references following the notacion 3.17 and indeed there is such a one entitelled 'Bad debts, protection against; effect of co-insolvency on suppliers'. From this, he is led to the Abstracte of this treatise in the chiefest Parte of the Compendium. Were he, with more ambition, to seek a Booke about Bad Debts, he may use the shorter notacion 3.1 to consult another Parte called 'Bibliographie', which informs him first if there be such a Booke and, second, where it hath been reviewed. Among the many Bookes treating of the affairs of Accounting and Finance he will find one entitelled 'The Wreck of the Penn Central' (which doth suggest Bad Debts).

WEIHS, JEAN RIDDLE *and others*. Nonbook materials: the organization of integrated collections. 1st ed. Ottawa: Canadian Library Association, 1973. 107 pp. $6.50 (ISBN 0 88802 091 0)

This manual was produced in consultation with a Joint Advisory Committee on the Cataloguing of Nonbook Materials, composed of members of five interested North American organizations. A preliminary edition produced a large number of suggestions and criticisms from practitioners, which have been incorporated into the present first edition, where this was thought reasonable.

The work aims to provide the necessary information for libraries and media centres wanting to interfile their catalogue entries for all media, conventional or otherwise. To eliminate the need for recataloguing book collections, the present manual has developed its rules according to the *Anglo-American Cataloguing Rules*, varying them only when the nature of the material demands it.

The first chapter is devoted to exposing the alternatives available to the maker of cataloguing policy. This is followed by abundantly illustrated rules for cataloguing nonbook materials of many kinds: audiorecords, charts, dioramas, filmstrips, flash cards, games, globes, machine readable data files, maps, microscope slides, models, motion pictures, pictures, realia, slides, transparencies, and videorecords. Chapter 3 explains how to make references to material not listed in the catalogue, chapter 4 gives a glossary and list of abbreviations and chapter 5 deals with the storage of various types of nonbook material. Appended are: an alternative method for handling a special non-integrated map collection and the International Standard Bibliographic Description (ISBD). The work concludes with a bibliography of some one hundred items and an index.

In view of the current interest in integrating multimedia collections, the present work should be of great assistance in achieving what is philosophically desirable with the minimum expenditure of effort and money. The wealth of examples adds considerably to the book's practical value.

KATZ, BILL *and* GARGAL, BERRY, *eds*. Magazines for libraries: for the general reader, and school, junior college, college, and public libraries. 2nd ed. New York and London: Bowker, 1972. 822 pp. £11.00 (ISBN 0 8352 0554 1)

The second edition of this publication has almost doubled the number of journals included (4,500 titles) and all entries have been checked and amended where necessary. "Its purpose it to suggest to the general reader and the librarian the titles best suited for his individual needs." Although it is basically for American schools, colleges, public and general libraries, it would be useful to any person requiring fuller information about journals than is usually found in directories. Most of the publications are in the English language.

The arrangement is by fairly broad subject headings, usually employing those used in Ulrich's *International Periodicals Directory*. At the beginning of each section the titles of basic periodicals, abstracts and indexes to the subject are listed. The information given for each journal includes date of commencement, frequency, price, editor, address, circulation, whether articles are refereed, and the names of the suppliers of microforms and reprints of the journal. In addition there is an indication of the level of the publication and a note of where it is abstracted or indexed. There then follows a description of the scope and quality of the contents, including the types of articles, news items, letters, illustrations, etc. If the entry is not written by the editors it is initialled and a key is provided to the full name and position of the contributor. There is an index by title and also a bibliography of subject bibliographies to periodicals.

LIEBESNY, F. *ed*. Mainly on patents: the use of industrial property and its literature. London: Butterworths, 1972. 210 pp. £5.00. (SBN 0 408 70368 7)

Designed to give an insight into both the legal implications and information potential of patents, this publication should prove a useful reference aid for the wide range of laymen involved perforce in the exploitation of patents, from the executive licensing an invention to the scientist extracting previously unpublished information. This ten-chapter work, written by the editor and seven other specialist contributors, contains chapters on British, American and other foreign patent systems, with further chapters on trade marks, the exploitation of inventions, and the protection of industrial design. An outline of the British patent classification and the tracing of relevant patents, and a guide to the extraction of information hidden by the legal jargon 'patentese', are also included. Patent systems, essentially unchanged for many years, are now in a state of change throughout the world. Chapters on the history of the present patent systems, possible future systems, together with an indication of the current changes given in other relevant sections, enable the reader to be aware of probable future developments.

Not designed as a legal handbook, this publication contains general patent information in a readily accessible way and, through a chapter by chapter bibliography, gives guidance to those requiring a more legally orientated approach.

WASSERMAN, PAUL, *ed.* Awards, honors and prizes: a source book and directory. 2nd ed. Detroit: Gale Research Co., 1972. 579 pp. $24.00.

This revised second edition lists 3,243 awards, ranging in importance from the Nobel Peace Prize to the Worst Buster Award, given to publicize acts of outdoor vandalism, and from prizes of $10,000 to a framed certificate. The increase from 2,338 awards listed in the earlier edition is partly due to the inclusion of the more important international and non-American awards, although the emphasis is still on American and Canadian awards. More awards in the fields of public service, military service and sport have also been included. The large print and great use of spacing, indentations and capitals also add to the bulk of the directory.

The text is arranged alphabetically by sponsor, with cross-references from the establishing organization or person. As well as the address of the sponsor, each entry gives the purpose of the award, the form and frequency of the award, and any other relevant information, such as qualifying restrictions.

There is an index by title of award, and a subject index, which gives sponsor and awards listed under broad subject headings, such as 'Boxing' or 'Chemistry'.

This directory will probably be of limited use to librarians in this country, as only the major European awards are given.

BLUE CIRCLE
GROUP

Assistant Information Officer

The Associated Portland Cement Manufacturers Ltd invite applications for the post of Assistant Information Officer in the Library at their Research Department, Greenhithe.

Duties will include maintenance of current awareness services, production of journal and patent abstract bulletins, information searches and preparation of bibliographies Library qualifications or experience of this type of work essential and knowledge of one or more modern languages would be a useful advantage. The position is open to either male or female applicants and with an age range from 22-45.

Applicants should have obtained either "A" Level standards or University degree in appropriate subjects The competitive commencing salary will depend upon qualifications and experience and there will be membership of a contributory pension scheme, profit sharing bonus and house purchase schemes after appropriate qualifying service

Applicants should write giving details of their career to date and personal details to –

General Manager,
Research & Development,
The Associated Portland Cement
Manufacturers Ltd.,
Research Department,
Greenhithe, Kent DA9 9JQ.

TRANSLATOR

An assistant, preferably aged 25-35, is required for Group Translation Department.

Applicants must have an advanced knowledge of German, a good knowledge of French, plus one or more other languages in either the Romance or the Scandinavian group, or both.

They should have had several years' experience in commercial and/or industrial operations in which languages have played a major part.

Preference will be given to applicants having MIL, AIL, a degree in applied languages or other advanced language diploma.

Initial salary will be appropriate to qualifications, age and experience, the Conditions of Service include a wide range of fringe benefits.

Please write for application form, quoting Ref. P.48/3 to:

Miss A. F. Donald, Group Recruitment Officer,
Pilkington Brothers Limited, Head Office,
Prescot Road, St. Helens, Lancs. WA10 3TT.

PILKINGTON

CRANFIELD

School of Management

Senior Research Post in the Management of Information Services

A qualified Librarian or information scientist with a research inclination is required for a three-year research programme seeking to identify measures of the value of information. The project, which is due to begin in October 1973, is funded by OSTI and is under the direction of Professor Gordon Wills in the School of Management.

The appointment will be on a salary scale commencing at £2715 per annum with F.S.S.U. membership.

Further details and an application form are available from The Registrar (Appointments), Cranfield Institute of Technology, Cranfield, Bedford, MK43 0AL, quoting reference 162.

FOCAL BOOKS

FILM LIBRARY TECHNIQUES

Helen P. Harrison

Some existing literature has been devoted to newsfilm, but the librarianship aspects have been neglected. This book fills a real need and will assist librarians with the formation and upkeep of newsfilm libraries. It will be useful to personnel in business and research who are setting up their own, making use of those which already exist, or using microfilm to economise on storage space; and to those who work with film, television and news programmes.

The author sets the problems of space limitations against the continually growing wealth of material to be stored and the importance of accessibility for speedy retrieval. She discusses the type, qualifications and organisation of the film library staff and the lay-out, planning, economics, expenses and income of the library. She deals with copyright problems, reviews the current situation in the field and the likelihood of film continuing as a major medium for the long term storage and preservation of visual news.

272 pages 17 diagrams Price £4.00 net

FOCAL PRESS, 31 Fitzroy Square, London W1P 6BH

Bibliographies are the librarians' primary aids . . .

LIBRARY ASSOCIATION BIBLIOGRAPHIES INCLUDE:

Bibliography of the dog. E. C. Jones. £12 (£9.60 *to members*)
London theatres and music halls, 1850-1950. Diana Howard. £4 (£3.20 *to members*)
Bibliography of nursing literature. A. M. C. Thompson. £4 (£3.20 *to members*)
Bibliography of film librarianship. Sam Kula. £1 (£0.80 *to members*)
Serial publications in the British parliamentary papers. Frank Rodgers. £2 (£1.60 *to members*)
Steam locomotive development. Kevin Jones. £2.25 (£1.80 *to members*)

Write for our Publications List to:

THE LIBRARY ASSOCIATION,
7 Ridgmount Street, London, W.C.1.

Library Removals start here

In Bullens planning office.
Every move is planned in detail,
problems of access or timing overcome;
men, vehicles and equipment allocated –
well before the move begins
So you move safely, quickly and with least
disruption
That's the difference between Bullens
and any other contractor.
Phone today.

Bullens
TRANSPORT SERVICES

406, Hornsey Road,
London, N 19 4EB
Tel: 01-272 6671

*Also at Bristol, Hinckley
and Newton-le-Willows.*

A Gillspur COMPANY

FIRST for carpets
Dodson Bull

UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display

In our extensive London and provincial showrooms

Free brochure on request to Dept ALB

DODSON BULL CARPET CO. LTD.

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-6 North Road BN1 1YA. Tel: 66402
BRISTOL: 2-3 Royal London House, Queen Charlotte St
BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SB.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 8LB.
Tel: Southend 46569
9 00-5 30 Mon.-Fri Sat 9.00-12 00 (Manchester 9 00-4 00)

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of {specific / recent} information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

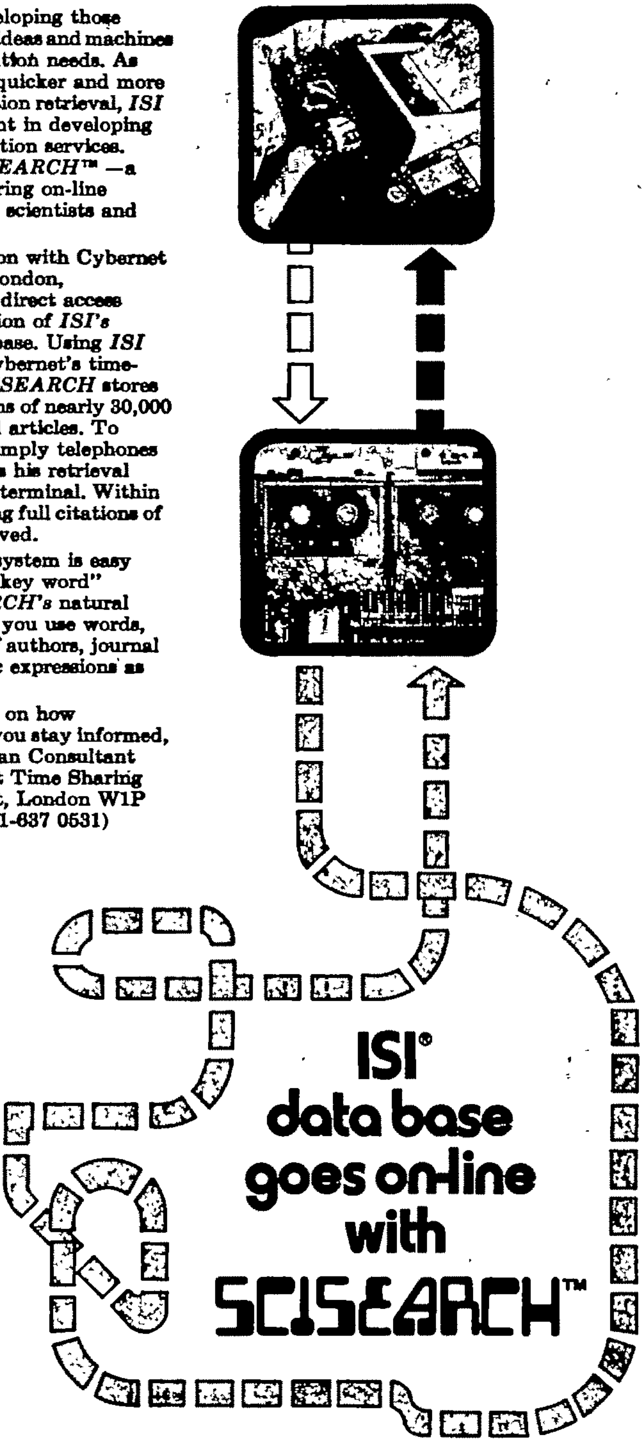
(Phone: 01-636 7543)

ISI prides itself in developing those combinations of people, ideas and machines that solve your information needs. As new research demands quicker and more comprehensive information retrieval, *ISI* is always at the forefront in developing new and better information services. And now there is *SCISEARCH*™ —a commercial system offering on-line information retrieval to scientists and librarians in Europe.

Developed in conjunction with Cybernet Time Sharing Ltd. of London, *SCISEARCH* provides direct access to the most recent portion of *ISI's* multidisciplinary data base. Using *ISI* Magnetic Tapes and Cybernet's time-sharing computers, *SCISEARCH* stores bibliographic descriptions of nearly 30,000 newly published journal articles. To conduct a search, one simply telephones the computer and enters his retrieval terms through a remote terminal. Within minutes, a listing showing full citations of relevant articles is received.

Besides being fast, the system is easy to use. Not limited to "key word" vocabularies, *SCISEARCH's* natural command language lets you use words, parts of words, names of authors, journal titles, and alphanumeric expressions as retrieval terms.

For further information on how *SCISEARCH* can help you stay informed, contact the *ISI* European Consultant nearest you or Cybernet Time Sharing Ltd., 93 Newman Street, London W1P 3LE, England (Phone 01-637 0531)



isi®

**Institute for
Scientific Information**
325 Chestnut Street
Phila., Pa. 19106, U.S.A.
Phone: (215) 923-3300
Cable: SCINFO
Telex: 84-5305

**HEADQUARTERS
EUROPEAN
CONSULTANTS**
P. Dodds
132 High Street
Uxbridge, Middlesex, U.K.
Phone: Uxbridge 30085
Telex: 933693

European Consultants
J.B.V. Buttlar-Brandenfels
6903 Neckargemund
Hirschgasse 11A.
West Germany
Phone: 062 23/3132

H.R. Collier
49 Avenue Paul Doumer
Paris 16, France
Phone: 870-80-58

Eastern Europe
J. Elliott-Patterson
2340 Modling
Badstrasse 24, Austria
Phone: 02236 47185

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib

CALCUTTA UNIVERSITY CENTRAL LIBRARY.

Proceeding

THE ORGANIZATION OF MODERN NEWSPAPER LIBRARIES

One-day Conference, London, 23rd March 1973

Problems of storage and obsolescence *John King*

Classification for news libraries *Geoffrey Whatmore*

Technological changes that may affect newspaper libraries in the future *P. McC. Montague*

Towards a follow-up care program for *ad hoc* translations *C.M.A. Knul*

JUNE 1973
VOL. 25, NO. 6

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of {specific / recent} information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

LIBRARY UNIVERSITY

Aslib Proceedings

VOLUME 25 JUNE 1973 NUMBER 6

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for Contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double-spaced, single-sided, on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.•

Problems of storage and obsolescence

John King

Chief Librarian, Beaverbrook Press

Paper presented at a one-day Conference on 'The organization of modern newspaper libraries', London, 23rd March 1973

The functions of a newspaper library

My brief in this programme is to talk of storage and to try to define obsolescence as applied to newspaper cuttings.

Before attempting this, however, I think it would be appropriate for me to describe briefly the functions of a newspaper library. I hope those to whom I am preaching will bear with me for a short while.

Newspaper libraries operate by streaming cuttings from a range of newspapers and magazines into General and Personal divisions. The result is that information is readily available on what a specific individual has done in his public life and which individuals have performed specific functions.

To feed these two streams newspapers are marked for previously determined headings, cut according to these markings and filed. They there lie fallow until called into use. Two versions of each story are usually kept, with the particular house journal's version being backed up by that of a rival publication.

The scope of information required should be predetermined at the marking stage. Once cuttings are marked they follow the stream, and a cycle of storage is set into motion. So-called 'weeding' (discarding of cuttings at a later date) starts an expensive second cycle.

The personal stream of cuttings is self-indexing and only principles dealing with hyphenated names, titles and other prefixes need to be laid down. This stream is 'self-cleansing'; as people die their deaths are recorded and weeding becomes automatic.

The general stream of cuttings is often a hotchpotch of titles evolved by various librarians over decades. The most frequently used headings are dictated by the form by which they are requested: for example one of the most common headings is 'articles'.

From this hotchpotch most newspaper librarians have now evolved—or are in the process of evolving—a thesaurus of headings. The use of a thesaurus has produced a fundamental change in newspaper library technique. The hotchpotch necessitated that markers should be blessed with an elephantine memory and could not be considered for this task until they had spent many years filing cuttings to develop such a memory. Because of this memory retention a mystique grew about marking newspapers and a library hierarchy was constructed with the marker at the top of the staff pyramid.

Or does the word Optimum ask me to indicate the *useful* life of a newspaper cutting. To this there is a very short answer—infinity. A newspaper reporter is a camera; not an original phrase, but very true just the same. An author who writes of an incident or a life has the blessing of hindsight. He would know the full effects of a Hitler or a Churchill. The 1935 reporter who met these people and recorded his impressions had no such knowledge. His interpretation, his judgement, was and had to be contemporary.

Can we destroy these reports? Is there a disposal cut-off point for such views? Some of the most pungent commentaries on politics of the thirties were depicted in the cartoons by David Low and Sidney Strube. Some of these cartoons have been reprinted in books and some of the originals still exist. But the only comprehensive record are the newspaper cuttings of the Evening Standard and Daily Express libraries. Would anyone dare advocate disposing of these?

I spoke earlier of the range of newspapers to be scanned: this includes nine national dailies, two evening papers, plus the seven national Sunday papers. Seventy-three newspapers per week have to be monitored therefore, or 3,800 per year. This means that at an average of twenty pages (forty for tabloid) per issue, they total 76,000 pages annually. Half of these pages will be advertising matter, while the rest will yield an average of ten cuttings per page. To cover this range completely a newspaper library must therefore expect to handle some 400,000 cuttings each year, or eight thousand per week.

The Daily Express library files between about seven thousand and nine thousand cuttings per week. During the first seventy years of its life this library grew to over thirteen thousand lineal feet, which in my arithmetic is a growth rate of over seven hundred cubic feet each year.

Now a thesaurus makes this apprenticeship period unnecessary. Today newspaper markers fit the story to scientifically devised headings. The main qualification now demanded from markers is the ability to evaluate versions of stories from other newspapers. Obviously he must mark the house journal's version, but he must then weigh up the alternative versions from other papers, taking, for example, *The Times* for political views, the *Daily Mirror* or the *Sun* for human interest stories, *The Guardian* for the arts, etc.

The newspaper library staff structure has three grades: filers and cutters who, as the name suggests, cut newspapers and file stories and pictures; enquiry clerks, whose essential skills are the capacity to mark newspapers according to predetermined headings and to translate requests into answers from the library's stock of information; and assistant librarians, or senior enquiry clerks, who have the ability and knowledge to organize or reorganize citations into as many facets as warranted. The duty times of enquiry clerks and assistant librarians are dictated by the hours during which the library is open.

I should like to end this very brief synopsis of how a newspaper library works with this point: before the thesaurus and its natural accomplice, microfilm, came into use, newspaper librarians were tied to a kitchen sink of duplicated and triplicated headings and, of course, suffered from space starvation. This greater emancipation will mean, I hope, that newspaper librarians can pay more attention in the future to the academic side of information storage which, I am sure, carries mutual benefits.

Optimum life of newspaper cuttings

What then is the optimum life of information stored in the form of press cuttings, etc? If this refers to the physical life span of newspaper cuttings then this seems to diminish each year. Newsprint is a volatile material, and as newsprint rises in price it appears to me to drop in quality. The Daily Express library has newspaper cuttings from the turn of the century in far far better condition than those of the 1960s.

At the moment I know of only two adequate methods of storage for this mountain of information: the steam age system of envelopes, filing cabinets, and seven hundred cubic feet of space each year, or microfilm. I, and many others, firmly believe that the future for this storage is film, though we probably differ as to the technique of such filming. Microfilm I believe does give a good cut-off point for newspaper cuttings.

A year or so ago I carried out a series of experiments upon the use made of newspaper cuttings. Each newspaper story reprints the salient points of information contained in its predecessors. I can confidently predict, for example, that the next robbery of banknotes from a train will recall the Cheddington Train Robbery of ten years ago. My experiments were designed to find out the incidence of reference for cuttings. As mentioned above, the Daily Express Library files some seven thousand to nine thousand cuttings per week and of these some 40 per cent were referred to later.

I also found that if, for example, one takes the total number of references as ten, then the first seven will occur within nine months of publication. A further reference will be made within three years and the last two will be from three years after publication to infinity. If therefore we substitute 'transfer to film' for 'cut-off point' it seems that three to five years is the elected span for newspaper cuttings.

Storage: local or central?

I will now tackle the last question in my brief: does every library need to store material or should there be some centralization?

I am enthusiastic about centralization, and would advocate a comprehensive library of newspaper cuttings published during the first half of the twentieth century. This library should be on film and all major newspaper libraries should pool their resources to make it truly comprehensive. In return they each would receive a copy of this film and each would immediately benefit from the space saved.

Such a central library could be financially self-sufficient. It should be allowed to sell this first half-century of classified information to all comers. To allow such sales each contributing newspaper should assign the copyright for this period to the Central Library.

How would such a scheme benefit me as a newspaper librarian? It would mean the release of some four thousand square feet of urgently needed space. It would relieve me of the onus of disappointing those students who start their appeals with the phrase: 'I am working on a school project concerning the sinking of the Titanic. Would you please send me all the newspaper cuttings you have on this subject.' Or the aged gentleman who writes from deep in the country: 'I have been a regular reader of the *Daily Express* for over fifty years. Sometime in the 1930s I remember you published an article about Simon Aleyn, the Vicar of Bray. Please send me a copy of this article.' Of course on that particular day he purchased a copy of the *Daily Telegraph*.

The pooling of information during the first half of the century might well reinforce my own stock, and how useful long runs of annual publications can occasionally be! Such a library could provide a home for these.

I must emphasize that I am speaking as a private individual but if there was a possibility of such an arrangement I would urge Beaverbrook Newspapers to participate wholeheartedly. I believe newspaper publishers owe this service to students and researchers. And last, but by no means least, think what an excellent proving ground for film technique or COM it could become.

DISCUSSION

MR S. PRYOR (Harmsworth Publications Ltd): 'I was struck by John King's division of his staff into "filers and cutters", "enquiry clerks", and "assistant librarians". These are divisions which we have discarded in favour of all staff (within reason and according to their experience) doing all the jobs in the library, becoming experienced in all its aspects, and finding the job more interesting as a result.'

MR KING: 'We found that staff wanted to specialize; many are women who want static hours and no weekend work. Filers don't like to be interrupted or asked questions and at the moment we have an agreement with the unions to have enquiry clerks, filers and assistant librarians.'

MR R. D. HEWLETT (BBC): 'The BBC uses four headings for classifying cuttings. Would the speaker say why he uses only two?'

MR KING: 'The *Express* has a personal and a general section. Obituaries are classified as personal until the subject dies, after which the obituary is numbered and stored out of the general run. This is an area that a centralized agency could well take over.'

CHAIRMAN (MR B. JEFFCOTT, Times Newspapers Ltd): 'Newspapers vary very much. Though the news is the same, the slant and amount of coverage may be different and a cutting that is important to one may not be to another.'

MR KING: 'The inquirer often needs confirmation from more than one source; one story from three different sources gives an all-round picture. Librarians should not try to decide on the relative importance of cuttings.'

MR G. WHATMORE (BBC): 'If a central cuttings library were established for the national newspapers and broadcasting it would have to contain all versions to be acceptable. The intake would be high and transfer to microfilm very early would be necessary. Does the speaker have any views about the acceptability of microfilm?'

MR KING: 'Reporters won't use microfilm as librarians do; they will only use print-outs and this is what the *Express* provides, at about 1½p per page of 10–12 cuttings.

I agree that all versions of news from national newspapers should be filed—but not necessarily that from local papers. An index would be essential and this could be provided on film. Beaverbrook Press is committed to going over to microfilm in about eighteen months time. The main cost will be in the original filming; copies are cheap.'

MR H. E. COX (IPC): 'Many journalists will say the old method of filing is best, but the problem of how to find the space is not easy to solve. What is the cost of the new system compared to that of the old?'

MR KING: 'Newspaper libraries were formerly staffed according to the number of cuttings put away but now the amount of space to be searched is taken as a criterion for the number of staff. Office storage costs at £8 per sq. ft. are a bit item. The cost of making a fiche, which takes a whole edition of the paper, is about 3p.'

CHAIRMAN: 'Microfilming other people's newspapers is an infringement of copyright. Such a method of storage can be for internal use only or for the use of posterity, which usually means outsiders. What is the duty of the newspaper librarian as far as this type of storage is concerned?'

MR KING: 'He should store everything because at the time of storage he doesn't know what value each item may attain in retrospect.'

MR L. J. ANTHONY (Aslib): 'So far we have spoken almost entirely of newspaper cuttings. Does the collection cover any other kind of material, e.g. government publications, statistics, etc?'

MR KING: 'Yes, all these plus a huge number of hardback books and encyclopediae, but cuttings are by far the most important.'

MR ANTHONY: 'It has been suggested that a National Library for the Social Sciences is needed in order to collect and preserve some of the primary material in this area. Would this be a suitable agency for a centralized collection of newspaper material?'

CHAIRMAN: 'It would if the newspaper groups would co-operate. The difficulty is that each group is looking after its own commercial interests. German newspapers have banded together to centralize storage of cuttings and *The New York Times* has also tried to do this.'

MR KING: 'I agree there are difficulties but they can be surmounted.'

MR J. DURHAM (Index Technology Ltd): 'Would the availability of an index to the major newspapers, which would enable the user to approach individual newspapers direct for the full text, be a solution to the copyright problem.'

MR KING: 'In 1967 we had the idea of taking all national newspapers and putting them in microform and making a monthly index from which the user could request the original. This ran into copyright difficulties because answers were supplied in the form of printout. There was also the problem of getting enough good indexers. Market research suggested it might have been a commercial success.'

Classification for news libraries

Geoffrey Whatmore

News Information Librarian, BBC

Paper presented at an Aslib one-day Conference on 'The organization of modern newspaper libraries', London, 23rd March 1973

THIS MUST be one of the very few, if not the only talk to be given in this country for a long time on the classification of press cuttings. So I have a large responsibility—almost an impossible one, really, to cover in the time available. I propose therefore to confine myself to certain broad aspects of the subject, the more so since I find that, whenever I sit down to consider news classification, I develop a headache!

The reason why classification of news is so difficult is because we are trying to organize current information while it is still in a fluid state—before its structure and underlying trends become apparent. It is like trying to study geology, before the earth has cooled. Nevertheless, our news systems succeed tolerably well in providing retrieval from numerous conflicting types of demand. So let us consider what we do and why we do it.

I am aware that in discussing classification at all I am entering a minefield. Others cleverer than me have been defeated by it; some have almost come to blows about it. The subject is attracting intensive high-level research at present from some very able librarians and information scientists. Yet news classification remains ill-defined and principles are elusive. We are dealing with the nuances of language in current affairs in the widest sense and, up to now, even the computer is having trouble with unstructured language.

The questions I shall be discussing are all confined to current information as presented in newspapers. They are these:

Classification objectives
Grouped or direct headings?
Form of heading
Multi filing
Are principles possible?
The future.

I would like to make two more remarks before we set off into the minefield.

I shall be using the word 'classification' a good deal. I am not at all sure that this properly describes our efforts to organize current information. Newspapers often call it 'marking'. Some would refer to it as subject heading work. But classification is a useful term, so let us leave it at that for the time being.

Nor, I may say, am I referring in this talk to indexing the press—only to the grouping of press cuttings. Indexing seems to me to require a somewhat different approach. To some extent, our problems seem unique, though not perhaps quite as unique as we like to think they are. But the organization of news items does contain some requirements different from other types of material.

We could, for example, spend an interesting hour considering why we do not use Dewey or why UDC is unsuitable. But since time is pressing let us accept that our work involves skilled subject heading allocation in an A–Z mode and move on from there.

Classification objectives

What are our objectives in creating subject schedules? I suggest that any classification should:

1. produce any specific cutting given reasonable data;
2. produce any significant fact published in the newspapers covered;
3. produce background information on any topic;
4. produce specific aspects of complex topics;
5. subdivide by excluding the irrelevant while retaining the relevant;
6. be capable of infinite expansion and immediate hospitality to new topics;
7. allow for frequent change of headings and subdivisions;
8. produce information very quickly;
9. permit rapid input;
10. reflect the way news is presented in newspapers;
11. employ memorable headings, for mnemonics are vital.

In a word, for current information, classification is a finding device. We are filing for finding. We are also attempting to arrange news in the categories in which it appears in the mind of the inquirer—and under the same names. To a degree, of course, it is the skill of the information worker to translate the inquirer's terminology into the terms used in the classification. But such is the speed required of news retrieval and such the fluidity of current information language that much more than normal flexibility is required of the subject schedules.

Grouped or direct headings

Having stated our objectives, let us now move on to discuss two fundamentally different approaches to achieving them—two which often become confused with one another in practice.

We can insist, in the words of Charles Cutter, the American pioneer of subject heading work, on filing everything under the narrowest heading that will contain it and then place it straight out. This is the approach of many American subject heading lists today, and, of course, the growing number of thesauri of descriptors, many of which are designed for computer work.

On the other hand we may prefer a degree of classification, grouping certain topics together under a superior heading, for the sake of convenience. For example, in the area of industry, we may wish to list all industries direct:

Electronics
Gas
Machine Tools

Plastics
Printing
Railways
Textiles

Some collections, however, prefer to bring their industries together, giving:

INDUSTRIES
    Electronics
    Gas
    Machine Tools
    Plastics
    Printing
    Railways
    Textiles

Immediately, we begin to raise questions such as: Should *Railways* be there, or is this subject better as a subdivision of TRANSPORT?

Again, should we use LABOUR as a main heading? If so, should labour questions of industries be filed here, leaving only technical and financial matters with the industry, thus:

LABOUR
    Electronics
    Gas
    Machine Tools
    etc.

Do we want all aspects of an industry together? Or should we file all aspects of labour questions together?

We could enlarge on these problems. Take the huge subject of religion, for example:

RELIGION
    Christianity
        Church of England
            Clergy
                Stipends

That is a hierarchical breakdown to reach the busy topic of stipends for Anglican clergy. Using alphabetico-classed schedules we can use any of the above headings as entry points, as main headings with subdivisions, or direct, for example:

Church of England
    Clergy
        Stipends

Clergy (Anglican)
    Stipends

or even:

Stipends, Anglican Clergy.

We may briefly consider another, more difficult, example concerned with material grouped under foreign place headings. Which is preferable?

RUSSIA
- Agriculture
- Britain-Foreign Relations
- Communist Party
- Elections
- Electricity
- France-Foreign Relations
- Motor Industry
- Politics and Government
- Supreme Soviet
- etc.

or

RUSSIA
- Agriculture
- Foreign Relations
  - Britain
  - France
- Industry
  - Motor Industry
- Politics and Government
  - Communist Party
  - Elections
  - Supreme Soviet
  - etc.

One uses direct headings, the other is semi-classified. There seems to be a case, and I am not sure of the basis of it, for grouping political aspects of foreign countries together but itemizing industries straight out. Perhaps it is related to the almost instinctive practice in general (British) topics of grouping EDUCATION but separating SOCIAL WELFARE, by common consent.

I am not proposing to discuss, through lack of time, the teasing question of priorities for place or subject in our schedules, though it is time we news librarians thought this one through. The point I wish to emphasize is that academic questions do not enter the choice. The reasons for preferring one or another arrangement are strictly pragmatic. They depend on the way the collection is used, on quantities, and on convenience of access.

Generally, it seems to me, the smaller the library, the more specific and direct the headings should be. As the collection grows, however, an element of classification will become essential if on no other ground than convenience of access—saving your feet. Nevertheless there is a danger in allowing complex ranks of subdivisions to proliferate. They are difficult to remember and are hard to write on cuttings as captions.

The alphabetico-classified approach provides more sophisticated retrieval but demands more knowledge from the classifier and the inquiry assistant. For your interest I have attempted to sum up the advantages and disadvantages of each approach in Table 1.

TABLE I

	Advantages	*Disadvantages*
SPECIFIC HEADINGS	Rapid retrieval Easy to understand Simple to find Fewer 'see' references	Splits related topics Needs extensive 'see also' references
GROUPED HEADINGS	Gives view of scope of a topic Better for inquiries in depth Fewer 'see also' references	Leads to very long headings Uncertainty of some placings New topics difficult to fit in

We should also remember, with an eye on the future, that the computer prefers short direct headings as descriptors.

Good classification is a compromise, of course, and most schedules combine both direct and grouped topics. We must never forget that in grouping similar things together we also separate them from others. For example, we can have:

AIRCRAFT—NOISE or NOISE—AIRCRAFT
again
POLLUTION—OIL or OIL—POLLUTION
again
SMUGGLING—DRUGS or DRUGS—SMUGGLING

One brings all types of SMUGGLING together; the other brings all DRUG offences together. The key decision to be made is the relative importance of the items to the library concerned. At present, in the first two examples shown, POLLUTION and NOISE would generally be regarded as paramount and become main headings accordingly. But a few years earlier, before these topics had reached their current prominence, each would have been a subsidiary of something else. This is an interesting example of schedule decay, to which even updateable alphabetical systems are prone.

I have entered only the foothills of this mountainous problem, but before we leave this part of the subject perhaps I should express my view that classified grouping for its own sake is always wrong and can lead to the virtual disappearance of items forced under headings not designed to embrace them. It seems to me that there is nothing to be gained, for example, from filing REFRIGERATORS or VACUUM FLASKS under some domestic or household heading, nor from filing, perhaps, WALKING STICKS under DRESS. 'If in doubt, straight out,' remains a useful rule of thumb.

Form of heading

The form of heading we use to describe our files is another large topic worth more detailed investigation than we are able to give it in the time available.

In news libraries we tend to be the puppets of fashion and the slaves of journalese. We must reflect common usage in our headings—but we should resist the latest vogue words. The best rule I have found is to follow the terminology of the day, but always remain a few months behind. Give passing jargon a period to blow itself out or become established. For example, MUGGING, a word imported from America to describe street attacks and robberies, which we had all coped with earlier under the name of the offence—robbery with violence, assault or perhaps theft. Suddenly inquirers start using this new word and we are obliged to reflect it. But for the time being, a reference under the jargon, indicating where it is filed, may be sufficient.

We saw the same thing with GAZUMPING—but is there not a subtle difference between these two examples? Mugging is a new word for an old offence and a reference therefore may be sufficient. Gazumping, on the other hand, is a new activity and should therefore have a distinct file heading.

Looking at headings in general, they should be clear, simple and memorable. We should use short words in preference to long ones, and we should use common words not scientific ones. Headings should employ the same words as appear in the news. But they should also be precise and say exactly what they mean. They should have the effect also of excluding irrelevant matters.

On the other hand—and there is always room for a contrary view when dealing with the imprecise and intuitive topic of human communication—it is sometimes a good idea not to be too specific. It is helpful if a little imagination and foresight can add breadth to a heading so that it is not unduly restrictive or too narrow for future amplifications.

One other large topic should be touched on in passing here. Although we are all guilty of it, it is not really sufficient to give a file a heading and leave it at that. As time passes the original intention in creating the file is forgotten and may come to be interpreted in a different way. Cross-division and woolliness creep in.

Most headings must be defined and this is the purpose of scope notes. They indicate not only what a file is intended to cover but what it should not contain. Many examples spring to mind:

DRUGS	Used for narcotics only; see MEDICINES for healing drugs.
EASTER	Used for stories of Easter customs and occurrences. For 'fixed Easter' see CALENDAR.
MINES (NOT COAL)	
MINES (EXPLOSIVES)	
RADIO	Used for technology only. For other aspects see BROADCASTING & subdivisions.

Multifiling

We now come to the controversial question of multi-filing. I have deliberately left this aspect of our work till late. It is the unique factor in press cuttings systems—and like a drug—offers substantial benefits provided it is not abused. Because a single press cutting is cheap and can easily be duplicated we have a wonderful instrument for cross-referencing and, apparently, a means of responding to the multi-aspect demand which is a feature of news information services.

Multi-filing is another point where we part company with the classification purists. W. B. Sayers, a great pioneer of library classification, offered a number of 'canons of classification', one of which was: 'classes should be mutually exclusive', that is, there should be no overlap between categories. In our work, and in much modern classification theory, this cannot be sustained. A topic can be considered from many angles, and events are not organized on hierachical principles. News topics interact with one another and are wanted from many points of view, often by the same people at different times.

Put another way, current information is not a tidy world in a flat plane where events can be subdivided and interlinked by straight lines. It is more like a tangled ball of wool, where an open end may lead to the centre or lead nowhere, and touch many half-related strands on the way. Modern classifiers grope with these problems using facets, modifiers, arrays and colons. We had great hopes that the computer could solve multi-facet retrieval, but so far it has proved a disappointingly crude instrument.

In press cuttings collections, however, we have the boon of multifiling. The filing of duplicate, triplicate or more copies has an essential place in our activities. The need arises in a number of ways. As we all know, personality and place are as important to us as subjects, and additional copies are required to cover these aspects. Many news items have a genuine multi-topic content, which arises from the way news is presented. There is too the important matter of subject analysis where, in larger systems, aspects, quotations and angles lower down the column require to be covered.

Having said all that, however, I cannot believe that multi-filing should be employed as a general panacea. In the course of rapid classification of news there is a strong temptation to take additional copies as a substitute for thought. It is easier, and sometimes quicker, when the choice of heading presents some difficulty, to take an item for several places instead of choosing one. In my opinion, this is the temptation of the devil. The abuse of multi-filing causes great extravagance. The habit escalates and our files become stuffed with peripheral items which are not far away from rubbish. Far from helping retrieval, a file full of matters only marginal to its true topic obstructs rapid access and is of no help to inquirers. Too much can be as bad as too little.

The news classifier's job requires a rifle not a blunderbuss. It requires precision and a set of rules. It is much more skilled than is generally recognized. It may be helpful to suggest when not to duplicate news items in the files:

Do not

1 duplicate continuing stories—choose one place and refer from others;
2 duplicate for fear of being caught out;
3 spread copies for the sake of easy finding;
4 duplicate to save thinking.

There is one additional circumstance, sometimes overlooked, where it seems to me that multi-filing *is* permissible. If no existing heading fits a new topic, it is sometimes better with 'one off' items (non-continuous stories) to file at two of the 'nearest' headings rather than create a new file.

I should mention one further point, because I know someone will raise it. News libraries find it essential to respond to demands from several quarters for the same information at the same time, or nearly so. This has led to a call for multi-filing to meet multi-demand. It seems to me that multi-demand is an entirely separate issue from matters of classification. If two people essentially need the same files at the same time, then the files may need to be duplicated; but not, surely, duplicated under different headings and using the accident of alternative placings to provide extra copies.

Are principles possible?

Finally, are principles possible, or is subject subdivision purely pragmatic? I started this talk by drawing attention to the elusiveness of the principles underlying what we do. I make no apology for having strayed into pragmatism, although I have attempted to consider some fundamentals on the way. If pressed, however, I might offer the following few practical guidelines, if not principles, for classifiers:

1. Choose one specific heading as a main place and stick to it.
2. The choice should be based on:

   (a) how it is likely to be asked for again;
   (b) what contribution it makes to a file;
   (c) consistency in relation to what has gone before.
3. Have a clear reason for any subsidiary place chosen.
4. Record your decision.
5. Use plentiful references, particularly for retrospective changes.
6. If a topic changes emphasis, follow the change, but remain some way behind.
7. Think like the inquirer thinks and anticipate his needs.
8. Beware of feeding files, just because they are there.
9. Ignore headlines and catchwords in allocating subject headings.

The future

We now have to prepare for a future whose shape is rapidly becoming clear—indeed it is not far away. What we are doing now should be with an eye on mechanized retrieval just over the horizon. Auto-retrieval is hesitant and by no means right for us as yet—but is going to come.

In many ways news libraries should be the first to automate, especially in the provinces where computers are beginning to revolutionize composing. Mechanized retrieval should come in on the back of computer type-setting; but computers need standards, uniformity, discipline. They need method not instinct; principle not experience. That is why it seems to me important now to examine what we do and rationalise it into principles. When we know why we operate as we do, we can see the next steps and save our collections from being overwhelmed by sheer volume of intake, as some of them are presently in danger of doing. If we do not do it ourselves, the systems analysts will do it for us.

It is possible indeed, one day, if machine readable free-text searching under computer control improves, that we shall not require to classify at all. And certainly post-coordination, it it can successfully be applied, would solve some of our intransigent problems. But that day is not with us yet and before we can move on to better systems, we should strive to improve our present methods. And that is what I have tried to start you thinking about in this paper.

DISCUSSION

MR C. M. ADAMS (Birmingham Post and Mail Ltd): 'The qualities which make good news are not necessarily those which lend themselves to objective classification. Would the use of post-coordinate systems be an answer? The fact that a percentage of false drops occur in such systems might well be advantageous in newspaper work.'

MR WHATMORE: 'Journalists are unlikely to be willing to bend their system to suit us and, at the moment, they are not willing to work through an index and want press cuttings rather than filmed replicas.'

CHAIRMAN: 'What does a librarian do on taking over a system which is not classified and arranged in the way suggested by the speaker?'

MR KING: 'Every newspaper uses a different language for its headings and these must be accepted.'

MR WHATMORE: 'All systems tend to decay and die after X number of years and some newspaper systems are approaching this point. If a new start is to be made it should be from some common denominator.'

CHAIRMAN: 'Is a common denominator possible? Can all libraries use the same system in view of their different needs?'

MR WHATMORE: 'Even if the slant is different the basic information is the same so why not use the same headings?'

MR J. GURNETT (Times Newspapers Ltd): 'The *Times Index* is about to embark on a programme of expansion and the new *Index* will include references to the *Sunday Times, Times Literary Supplement, Times Educational Supplement,* and *Times Higher Educational Supplement.* Because of this we have decided to compile a thesaurus to the subject headings. Should this thesaurus not be a co-operative effort and become a standard list that all newspaper libraries could use?'

MR WHATMORE: 'The *New York Times* has a thesaurus already but it has not been found suitable for UK newspapers. I am in favour of someone producing a thesaurus which will suit all systems but *The Times'* headings do not meet this need.'

MR KING: 'By and large the users of newspaper libraries are the same group of people, who may move from paper to paper. But the *Times Index* is probably used more than the newspaper libraries are by professional people outside newspapers.'

Technological changes that may affect newspaper libraries in the future

P. McC. Montague

Director and General Manager,
Birmingham Post and Mail

Paper presented at an Aslib one-day Conference on 'The organization of modern newspaper libraries', London, 23rd March 1973

WHEN I was asked to give this paper today I felt somewhat fearful. My direct involvement in newspaper libraries had comprised downing pints of beer with Ken Murphy at *The Guardian,* being appalled by the problems of moving *The Guardian's* and *Manchester Evening News'* libraries in Manchester over one long weekend, and discussing staffing problems in Birmingham with Geoff Adams.

My impression of newspaper libraries was probably typical of many production staff—it's there but we are not quite sure how it works or what it does. So I had to find out how things worked in fact. It was at this point that I began to realize that the production departments, and the library function could, and possibly should, run parallel courses. The new technology of production could provide great opportunities for the development of the operation of the library function. Not only that, but in addition the role of the library could and should be changed dramatically to the benefit of the publisher.

Let me start then with the technological revolution that is available to production as it now is. Historically editorial and composing rooms have scarcely altered in systems or techniques for the past forty or fifty years. Minor changes have occurred but very little of consequence. Then eight or nine years ago little things started happening: computers started to appear as an adjunct to production—some stayed, some went, some were operated, some stayed under dust sheets. All in all nobody using them in conjunction with hot metal line casting machines really achieved a great deal. (I believe a certain American newspaper has tried to develop a massive computer data store for its library with somewhat less success than it had hoped for.) All the hoped for savings disappeared in extra payments, extra staff, and hidden extras elsewhere. In a nutshell the computer allied to mechanical production machinery was not a real success.

However, with the rapid development of web offset newspapers during the 1960's photo-composing had become a more developed technique. The capabilities of photo-composing machines had improved both in speed and in versatility. At the same time prices have come down. Small letterpress newspapers in the US started to introduce computerized photo-composition and revert to their letterpress printing units. This is rapidly becoming possible for the medium and larger scale newspapers—*The Sunday Mercury* with a circulation of 230,000; *The Evening Mail* with a circulation of 380,000; *The Birmingham*

Post with a circulation of 65,000 daily. In total, well over five hundred broadsheet pages go through our composing room each week, with seventeen editions daily of the evening paper and three each on the daily paper and Sunday paper. Not only does our composing room have quite a job, but so does our librarian. Even in a newspaper group of our size we are setting out on the path of photocomposition. We placed an order for our first machines on 22nd March and will be accepting delivery in May/June.

What on earth, you might ask, has this got to do with the operation of the library? In simple terms it could and should mean the beginning of the end of a great deal of the drudgery and menial aspects of the library. From the photocomposer, the composing room will produce full page paste-ups. These in turn will have a 'positive' or 'negative' taken from them. From the library point of view, I can see no technical reason why microfilm could not be taken at this stage of all relevant pages. From this point on, the whole operation of the library changes.

Within hours of production of the newspaper, the librarian can receive his microfilm. He can use visual display units to read the paper. A light pencil can be used to mark the keywords or any other reference system. The index can be typed direct into a computer containing the index, which could then be continuously updated. The skill of the librarian in indexing and referencing will be emphasized even more than it is now.

I am not fully acquainted with the technology of microfilm retrieval systems, but I would assume that the further implication of this sort of system could be the almost immediate and automatic retrieval of information when the editorial departments want it. They could use visual display units or receive electrostatic, diazo, or ink jet printed copies of relevant material.

If I can hark back to the days of ten years ago when I worked for an engineering firm on the technical side, I remember that all correspondence was microfilmed and, by referring to the correspondent and year, one could have available all relevant letters. This, remember, was years ago.

What I am saying in principle therefore is that the technological revolution in production is making it possible for libraries to receive, almost immediately, microfilm of all matter within the paper. Alternatively data stores can be created, since all photo-composed matter will in time go through computers. Whichever path is wanted can be provided as a natural extension of production.

What I have outlined is a quite practical concept. But I would like to add a few comments about the further implication of production technology upon not only the operation but also the role and the scope of the library. The library function tends to be underused in the newspaper industry. This is partly the librarians' own fault. They have available a mass of information, yet they have not fully sold their services to their own publishers. The publisher's role is to disseminate information, news and comment through the columns of the newspaper. The library should be a natural extension to this. The new technology makes this even more possible than it has been in the past. Reprints of articles, complete copies and pictures are a natural extension of microfilm libraries. Printing techniques make it more and more feasible to produce reprints directly from the library. Electrostatic printing and perhaps the latest developments in ink jet printing make this quite possible.

Thus the library can incorporate a reprinting function. This applies equally to advertising matter just as much as to editorial.

Going still further, the inter-relationship of libraries in newspapers throughout the UK is becoming increasingly easy. We as a company are introducing document transmission using GPO lines. This could be a useful aid in retrieving information from other libraries. IBM assure me that retrieval direct from microfilm is feasible. These are changes in technology which imply central referencing systems and close relations between libraries.

Is it too optimistic for me to look towards the newspaper library as becoming an information centre not only for editorial but also for advertising, not only serving anyone in its own area but also other newspapers?

If these changes in operation and role are to be achieved it is essential that libraries 'sell' their function. May I dare to suggest that you should hang onto the tail of the production revolution to obtain the capital and integrated operation that will help you? Those in Fleet Street might be cynical about the speed of the technological revolution, but certainly the provincial press is moving forward steadily.

In summary I would like to make four points:

1. Do not isolate yourselves from production technology. It can offer you improving facilities for immediate availability of condensed data, either through microfilm or data bases in computers.
2. Look for extensions to the facilities you can offer internally and externally in the form of reprints.
3. Integrate the services you can offer by having as far as possible common referencing systems. In this way cross supplying of information can be done quickly and smoothly.
4. Sell yourselves to your publishers as an extension of his newspaper function—providing information internally, and selling it externally.

DISCUSSION

MR G. M. ADAMS (Birmingham Post and Mail Ltd): 'I am concerned about the commercialization of the newspaper library. However, ultimately, the logical end of some of the technical developments mentioned might be the disappearance of newspapers altogether. Has the speaker looked this far ahead?'

MR MONTAGUE: 'I do not see any serious intrusion of this kind. Nor do I think technical developments will bring newspapers to an end, but newspapers should enjoy a wider role and libraries can play a part in this. It is essential for librarians to sell themselves to the publishers in order to obtain resources to develop different commercial enterprises.'

MR R. D. HEWLETT (BBC): 'I believe the BBC have patented a system for bringing the pages of newspapers to the public via television.'

MR MONTAGUE: 'It is technically feasible but other considerations include acceptability to the public and the effect of pressure groups. Local newspapers have a special role and may not be affected as much as the national papers.'

CHAIRMAN: 'Local newspapers are one of the major sources for providing local information, whereas in London this role is carried by the public libraries.'

MR MONTAGUE: 'I believe local newspapers should be integrated with the local community.'

MR ADAMS: 'There should be full co-operation with local public libraries on the supply of information. However, there is sometimes a conflict of interest between responsibility to the editorial function and responsibility to the public.'

CHAIRMAN: 'Mr King, in his paper, suggested that material might be held in its original form for 4-5 years whereas the speaker is suggesting that we should start with microfilm from the beginning. Any comments?'

MR KING: 'I tried the speaker's suggested system in 1966 and found it impossible to keep up. Using a film immediately commits the journalist to viewing yet what they want to do is to sift and sort cuttings.'

MR J. DALIGAN (BBC): 'Mr Montague has criticized newspaper libraries for their old-fashioned methods and image. He envisages pages of newspapers being microfilmed as soon as they had been made up, and the microfilmed copies being sent to the library for immediate indexing, thus eliminating the need for files of cuttings.

Three years ago the BBC carried out a full scale experiment on indexing and microfilming newspapers. Normal staff and resources were allocated. Although the experiment was intended to last for ten days it was abandoned as a failure after five days, by which time it had become abundantly clear that the traditional way of filing press cuttings was very much cheaper, quicker and more effective than indexing the newspapers. The traditional method gives complete and up-to-date files, perhaps containing hundreds of cuttings, on any subject. In contrast, indexing newspaper pages in the way Mr Montague envisaged would only give an equivalent number of references to microfilmed pages, scattered throughout the system, each one of which contained numerous items of news unrelated to the subject being searched for.

We are all keen to modernize the present newspaper library but it should not be to the detriment of efficiency and service.'

MR MONTAGUE: 'I think this is probably true. We're still a bit thin on retrieval techniques but the concept must be explored.'

MR ATHERTON (Eastern Counties Newspapers Ltd): 'Much has been said about microfilm advantages in storage and retrieval but from experience of over twenty years use of microfilm records, unless they are well indexed the retrieval is not very fast—almost impossible, with insufficient staff to index all our papers. What production techniques might improve this microfilm indexing facility to libraries?

MR MONTAGUE: 'One method would be to get the journalists to act as indexers but this is probably not practical. Co-operation of the National Union of Journalists would be a prerequisite.'

Towards a follow-up care program for *ad hoc* translations*

C. M. A. Knul

European Translations Centre, Delft

IN HIS BOOK *The foreign language barrier in sciences and technology* (Aslib, 1962), C. W. Hanson wrote about 'the desirability of using one international language for scientific publication, whether it be an existing natural language or a constructed one'. 'This global approach to the language problem has some support,' he continues, 'but even if international agreement were achieved progress would be slow and it would probably be several decades before the international language was in anything approaching universal use.' Exactly ten years later, Prof. A. I. Mikhailov, director of the All Union Institute for Scientific and Technical Information (VINITI) concludes, speaking about ways to overcome linguistic barriers: 'the final solution of the problem lies in developing a universal language of science which will develop into a single language common to the world scientific community' (Invited Papers of the 36th International Congress of FID, Budapest, 1972). After ten years the problem of overcoming linguistic barriers in international exchange of information by means of introduction of a universal language appears to be as vivid as a full decade ago.†

The same may be said about another way of overcoming the barrier, namely the teaching of foreign languages. Though a great number of students and scientists nowadays make good use of fast teaching systems, results are hardly visible, when comparing translation effort during the last decade. C. W. Hanson has been rather optimistic about the substantial change mechanical translations would bring. Ten years later, Prof. Mikhailov still has to use terms like 'develop' and 'development' when discussing the possibilities of overcoming language barriers by means of mechanical translation. In fact, during the last decade machine translation encountered much criticism, so that much research has been stopped, while in other cases machine translation remained at the experimental stage. It must be said that machine translation nowadays is seen more optimistically after a period of scepticism (for example, by Bar Hillel). In general, it may be said that this particular way of overcoming language barriers is still in its infancy. The only reliable way of overcoming language barriers seems to be by means of human translation, however expensive and time-consuming it may be. During the last decade it appeared so, anyway, and I have no reason to assume that universal languages, foreign language teaching programs or machine translations will replace human translations in the near future. It is indeed remarkable that Mikhailov did not mention human translations at all as a way of overcoming language barriers, let alone the extensive (and highly money consuming) program for 'cover-to-cover' translations and 'selected articles' journals, which seem to meet about 45 per cent of the demand for translations. Until either a universal language has been accepted for all scientific and technical literature, or until each scientist becomes master of several 'core' languages, translations will continue to play an important role in the international exchange of information. And until machine translation has overcome its own limitations, human translations will be a very important tool for access to scientific and technical literature published in languages which are not common to the general scientist. Another way of overcoming the language barrier—and a very effective one—is the simultaneous publishing of the same text in several languages. In this respect it is of less importance, whether, for example, in the case of periodicals the same contents are published simultaneously on several editions in different languages, or in the form of bi-lingual, tri-lingual, etc., publications, for example, the various UNESCO and FAO editions. I would suggest calling such periodicals 'language equivalent editions' as the widely-used term 'multilingual publications' is also applicable to 'international journals', whose contents are partly in English, partly in French or German, or any other language. In fact, the latter does not contribute to the solution of the problems of linguistic barriers, but pre-supposes the multilingual capacities of its readers.

---

* The term 'follow-up care program' originates from the medical world and indicates any further treatment of patients who have been subject to medical intervention. As it is in the case of medicine, it is the same in translation: results of human activity are judged to be incomplete when no attempt is made to prevent them from being undone in the future.

† 'It is often thought that the English language is to be judged to a very great extent as an international science language. True as it may be for the Western world, at present 50 per cent of literature on science and technology is published in languages unknown to half of the world scientific community' (A. I. Mikhailov).

In principle there exists no difference between 'language equivalent editions' of a periodical and a 'cover-to-cover' translation of a periodical, though there are differences in time-lag and number of equivalent languages. An English language 'cover-to-cover' translation of a Russian periodical is in fact an English language equivalent publication for the Russian original. That is the reason why the European Translations Centre expanded for 1972 its *Translations Journals* to such 'languages equivalent editions', these not being a complete translation of the original, but a simultaneous publication. What happens in fact in the case of such simultaneous publications is that the problem of the solution of language barriers is moved from the user to the publisher. Nowadays most publishers of non-English periodicals have chosen, as an intermediate solution, to make the contents slightly accessible for English readers by means of adding summaries of the contents or giving the contents pages themselves in English too. However, one should realize that such an intermediate solution can hardly be a way of overcoming linguistic barriers. Apart from 'cover-to-cover' translations (most of them are English equivalent editions), there exists another group of translations, which seems to meet twenty per cent of the demand. This group covers the whole field between a single translation from one text and a 'cover-to-cover' translation. In the case where publication of selections from periodical literature is involved, some quite complicated publication schemes may occur (Figure 1). In the case where a regular publishing plan exists for some sort of selection, 'translations journals' are involved, and, if this is not the case, the publications are generally referred to as '*ad hoc* translations'. However, common parlance among translation circles admits quite a number of deviations in this respect, indicating a need for the introduction of

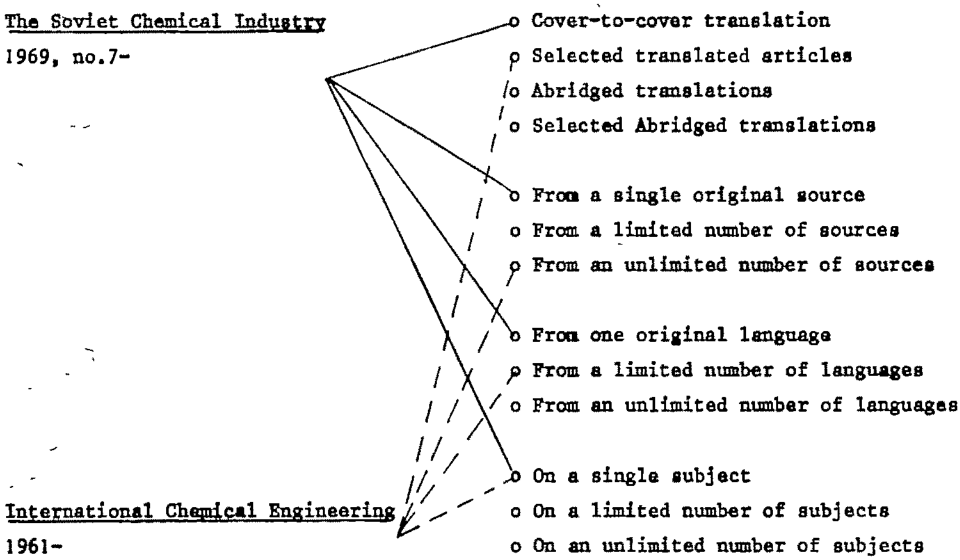

The Soviet Chemical Industry
1969, no.7-
International Chemical Engineering
1961-
o Cover-to-cover translation
o Selected translated articles
o Abridged translations
o Selected Abridged translations
o From a single original source
o From a limited number of sources
o From an unlimited number of sources
o From one original language
o From a limited number of languages
o From an unlimited number of languages
o On a single subject
o On a limited number of subjects
o On an unlimited number of subjects

FIG. 1: *Two examples of translations journals*

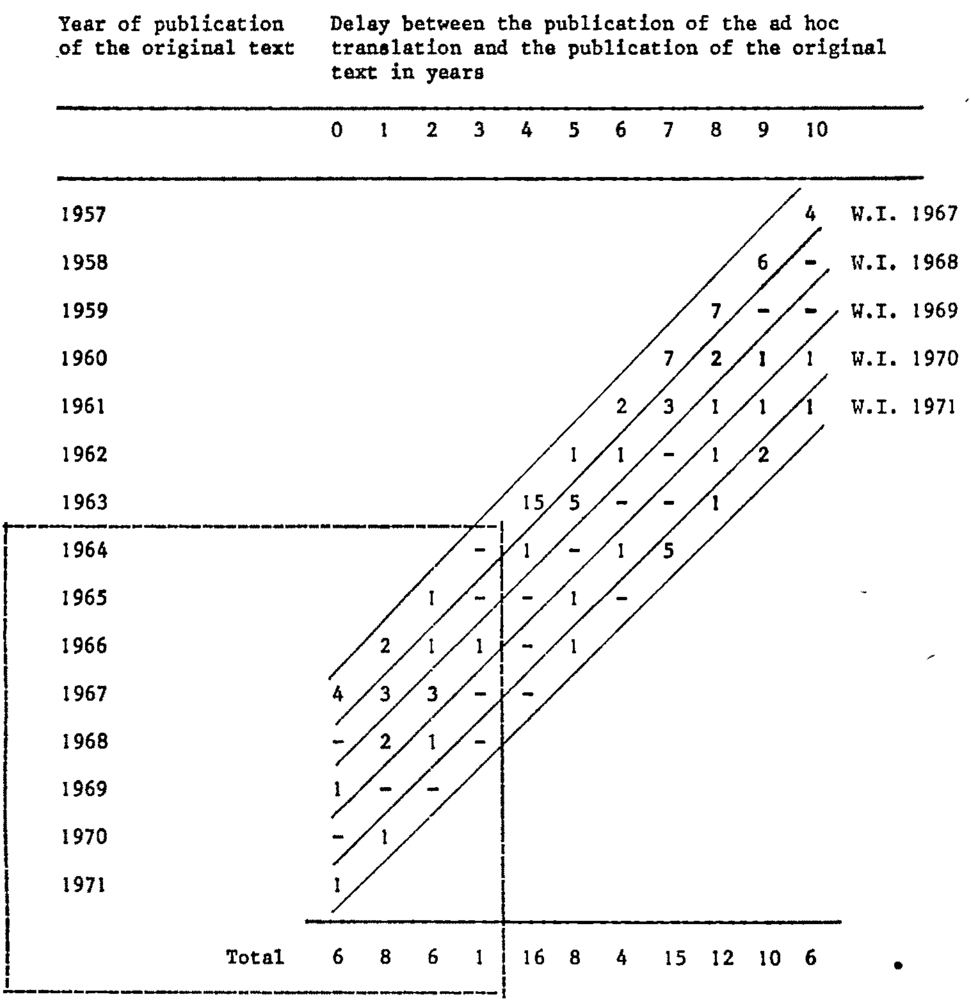
The Soviet Chemical Industry represents the common type of cover-to-cover journal. *International Chemical Engineering* is an example of an international journal.

In the diagram no attention has been paid to language of the translation and possible insertions of abstracts or original articles next to translations.

some international criteria. The *ad hoc* translations in general serve as an immediate solution to linguistic barriers, whereas translations journals (both 'cover-to-cover' or 'selected articles' journals) are more often bothered by insurmountable time lags of at least half a year in relation to the date of publication of the original.

Demand for translations arises during the first few months after publication of the original, the related abstracts journals, or the current awareness bulletins, and at this stage the 'cover-to-cover' translation may still be in preparation. This time lag may be shortened effectively by means of *ad hoc* translations. When the regular translation has been published, the *ad hoc* translation, which has been made from the same text, loses its function, except when the language of the *ad hoc* translation has not been the same as the one of the regular translation. It is obvious that the existence of a complete translation acts on the production of *ad hoc* translations in another way as well. A late regular translation raises the number of *ad hoc* translations from the source immediately after publication of the original, but diminishes the number of *ad hoc* translations for former issues of the original (Figure 2). Whereas the *ad hoc* translation is of temporary importance in the case where there is a regular translation, when no regular edition for the source is available.

The advantages of *ad hoc* translations of periodical literature are as follows (*ad hoc* translations of non-serial publication are not discussed here):



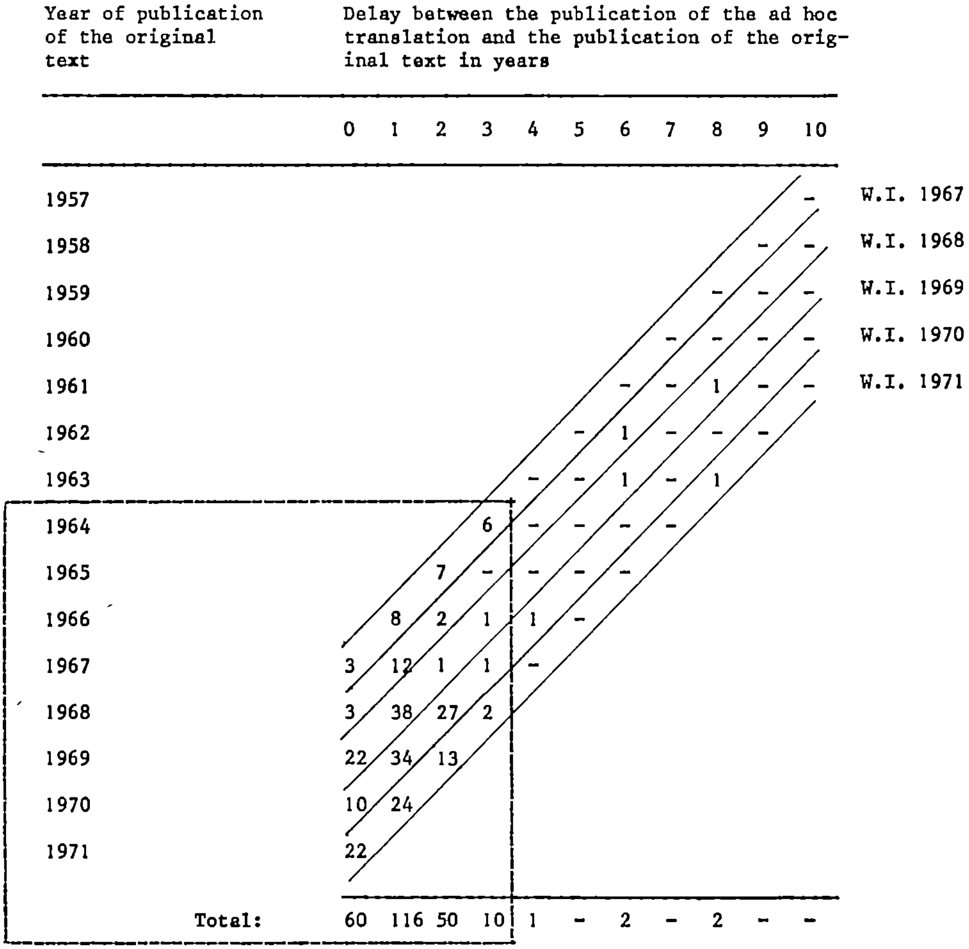
Year of publication of the original text	Delay between the publication of the ad hoc translation and the publication of the original text in years											
	0	1	2	3	4	5	6	7	8	9	10	
1957											4	W.I. 1967
1958										6	-	W.I. 1968
1959									7	-	-	W.I. 1969
1960								7	2	1	1	W.I. 1970
1961							2	3	1	1	1	W.I. 1971
1962						1	1	-	1	2		
1963					15	5	-	-	1			
1964				-	1	-	1	5				
1965			1	-	-	1	-					
1966		2	1	1	-	1						
1967	4	3	3	-	-							
1968	-	2	1	-								
1969	1	-	-									
1970	-	1										
1971	1											
Total	6	8	6	1	16	8	4	15	12	10	6	

FIG. 2: *Teploenergetika* (USSR)

This Russian journal is translated into English as *Thermal Engineering*. Publication of the translation began with 1964, vol. 11, no. 1. Figure 3 shows to what extent the publication of the cover-to-cover translation of this journal acts upon the production of *ad hoc* translations from the same source. For this purpose only translations into English have been taken into account.

Numbers have been derived from the annual cumulation of *World Index of Scientific Translations, 1967–1971* and are set in the form of a diagonal.

The square marked by the dotted line indicates the period covered both by the cover-to-cover translation and the annual issues of *World Index of Scientific Translations 1967–1971*. As contrasted with the data of Figure 3 below, the totals mentioned at the bottom of Figure 2 form a totally different picture. For this purpose only translations into English were taken into account to compose Figure 3.



Year of publication of the original text	Delay between the publication of the ad hoc translation and the publication of the original text in years										
	0	1	2	3	4	5	6	7	8	9	10
1957											-
1958										-	-
1959									-	-	-
1960								-	-	-	-
1961							-	-	1	-	-
1962						-	1	-	-	-	
1963					-	-	1	-	1		
1964				6	-	-	-	-			
1965			7	-	-	-	-				
1966		8	2	1	1	-					
1967	3	12	1	1	-						
1968	3	38	27	2							
1969	22	34	13								
1970	10	24									
1971	22										
Total:	60	116	50	10	1	-	2	-	2	-	-

FIG. 3: *Hutnik* (Czechoslovakia)

The square marked by the dotted line in this diagram indicates the same period as is shown in Figure 2 in order to facilitate comparison between the diagrams. However, the Czechoslovakian journal *Hutnik* is not translated on a regular basis.

No figures are shown for 1957, 1958, etc. under 1, 2, 3, etc., because publication of the *World Index* began only with 1967. Figures 2 and 3 are based on data published in the annual issues of the *World Index*. When older indexed material is amalgamated, the figures could then be extended to delays of more than ten years, which would be less useful.

1. They present an immediate solution to the problem of overcoming language barriers.
2. They are of temporary importance in the case where a regular translation will become available.
3. They are of lasting importance if this is not the case.

4. As the language of the regular translation is often English, *ad hoc* translations into other Western languages present a means of overcoming the inter-western language barriers.

However, the *ad hoc* translations, taken as a group, have a number of less satisfactory characteristics:

1. *Ad hoc* translations as a group may be distributed all over the world, even when they relate to the original journal.
2. The number of copies is limited.
3. As many *ad hoc* translations have not been deposited with translations centres or libraries, some of them may be difficult to trace in the future.
4. In comparison with regular translations, the *ad hoc* translations are more expensive to the user.
5. The production of *ad hoc* translations is to some extent unpredictable.
6. Time lags may range from several days after the publication of the original source to many years later (or never). However, most translations relating to a single source are made during the first few years after publication of the original (Figure 3).
7. *Ad hoc* translations need extensive and expensive indexing services.
8. Abstracts, journals and current contents bulletins usually refer to the original texts, difficult of access though they may be.*
9. The *ad hoc* translations are not always of the highest quality.
10. The multilingual character of *ad hoc* translations is not useful to native English readers.

At the European Translations Centre an attempt has been made to discover to what extent the above-mentioned disadvantages of *ad hoc* translations could be overcome. Therefore it has set up a follow-up care program for *ad hoc* translations relating to a restricted group of sources, namely the frequently translated publications from the Soviet Union and Japan. The conclusion has been that publication of another number of selected articles journals could be established on the basis of *ad hoc* translations already produced. Such a procedure would meet the disadvantages mentioned in items 1–4 above, would exert an influence on items 6 and 7 and would permit a check on the quality of the translations.

The multilingual character of the *ad hoc* translations would permit a larger number of articles published in the original to be covered by a translation in such a way that, if no translation into English was available, a French translation would be inserted, thereafter translations into German, and if no translation could be traced for one of these languages, then it would be necessary to fall back on translations into Swedish, Dutch, or Spanish.

If, for example, the European Translations Centre could obtain copyrights for translations from the Russian language journal *Chemical Industry—Khimicheskaya Promyshlennost, Moscow,* it could produce an anthology of all translations produced from the period 1955 to June 1969, after which date regular translations have been published. For that period, about 1100 translations are available, of which 650 are in English. In order to be as complete as possible, 230 translations into French and 190 into German would be added. The remaining thirty may be composed of *ad hoc* translations into Swedish, Spanish, and Dutch. In this way 35.5 per cent of all articles (probably also the most important ones) published in the Russian original could be available in a few volumes, whereas at the moment the information is scattered throughout the world. Sometimes as much as 45–50 per cent has been reached. The same could be undertaken for between about twenty to forty other publications from the USSR and Japan. As the European Translations Centre is the only indexing centre which is concerned with translations into several languages, and on many subject fields at the same time, it is obvious that it is ETC's task to carry out such an after-care program.*

---

* It would be useful, if abstract journals and contents bulletins would indicate the availability of translations, whether published in a 'translation journal' or existing as an *ad hoc* translation.

Application of the after-care program for *ad hoc* translations can be considered for the following situations:

1. To bridge the period between the first year of publication of the original and date of publication of a translated version.
2. To publish a current translations journal based on *ad hoc* translations, if no regular translation exists or is likely to be published.
3. To publish a current translations journal based on *ad hoc* translations, in case of publication of a new source, until a regular translation with shorter time lag has been entered.

An after-care program for *ad hoc* translations, as has been described above, is a more realistic short-term solution of language barrier problems than utopian thought on universal languages, teaching of foreign languages and, for the present state, even machine translation, which might, however, prove to be an excellent long-term solution.

On the other hand, an after-care program for *ad hoc* translations can never compete with cover-to-cover translations, for which it merely functions as a stand-in.

Finally, it must be said that an after-care program is merely an intermediate station on the long road to the final solution of language barriers in the exchange of scientific and technical information within the scientific community.

---

* The Russian journal *Khimicheskaya Promyshlennost* is an excellent example of a journal which could be considered useful as a specimen for this investigation (high rate of completed *ad hoc* translations, high rate of requests for *ad hoc* translations, finally judged to be worth producing as a cover-to-cover translation). However, the journal itself functions merely as a subject for the investigation. To avoid misunderstandings ETC does not plan a publication of an anthology for this journal, but for other journals which show the same characteristics, and which are not yet translated on a regular basis. A publication programme will be announced in due course.

BRIEF REVIEWS

BOWKER SERIALS BIBLIOGRAPHY SUPPLEMENT 1972. New York & London: R.R. Bowker Co., 1972. 357 pp. £6.00. (ISBN 0 8352 0588 6)

This is the first of a new series of supplements to the Bowker serials directories. It is supplement to the 14th (1971) edition of *Ulrich's International Periodicals Directory* and to the 2nd (1972) edition of *Irregular Serials and Annuals* and contains information on some 6,500 titles. 5,200 of these are current periodicals—titles issued at regular intervals more often than once a year—and 1,300 are titles issued annually, less frequently than once a year, or at irregular intervals.

The information about the serials listed, which was obtained from the publisher or from a specimen issue of the serial itself, includes title, frequency, publisher's name and address, Dewey Decimal Classification Number, country code, International Standard Serial Number, language of text, year first published or year of earliest known issue, price, special features such as book reviews or bibliography section, circulation per issue, and indexing or abstracting services in which serial is listed. The entries are presented alphabetically by serial title within subject sections. In other words the format and content follow the main Bowker serials bibliographies.

The main body of entries is preceded by a list of corrections to previous ISSN assignments (as given in the second edition of *Irregular Serials and Annuals*, July 1972); a country of publication code; a list of abbreviations, including abstracting and indexing services; money symbols; and key to subjects. At the end of the volume an Index to New Serials is given; this is an alphabetical list of serials issued since 1970 not previously listed in Bowker serials directories. This is followed by the Title Index.

This new publication will fill the gap between the full editions of *Ulrich's International Periodicals Directory* and *Irregular Serials and Annuals*, which are to be published in alternate years. While this *Supplement* includes only information on titles not previously listed in the main editions, future issues will include information on ceased and suspended publications and on title changes as well. We will therefore have a good serials reference work: we will know that the information provided in admirable detail by the two main volumes will be updated between editions. •

ELLIS, G.P. *comp*. Medicinal chemistry reviews: a select bibliography. London: Butterworths, 1972. 170 pp. £5.00. (ISBN 0 408 70409 8)

With the growth in the number of papers published in any given subject area the place of reviews is becoming increasingly important. However, even for a subject well covered by secondary sources it is a time consuming and difficult process to trace relevant reviews. Those engaged in the broad field of medicinal chemistry, including biochemists and pharmacologists, will welcome therefore this expansion of a bibliography published by the author a few years ago in volume 6 of *Progressive Medicinal Chemistry*.

This present bibliography contains details of approximately 4,000 reviews published between 1950 and mid-1972, comprising the more important monographs and review articles in English, with a selection of significant German and French contributions. Tracing a review on a particular subject in this publication is facilitated by the broad subject classification, with approximately sixty subject divisions, and the detailed subject index. Within each subject section arrangement is by date; references are then grouped by year and listed within each group alphabetically by author. Bibliographical details also include the full title of the publication, page span of the article, abbreviated journal title and volume for journals or, for monographs, the place and name of the publishers.

This publication should prove most useful to both subject specialists and librarians, although the latter particularly would welcome a list of expanded journal titles and an author index. An indication of the number of references contained in each review would also prove useful.

GODFREY, LOIS E. AND REDMAN, HELEN F. *eds*. Dictionary of report series codes. 2nd edition. New York: Special Libraries Association, 1973. 645 pp. $19.00. (ISBN 0 87111 209 4)

Those whose work takes them into the jungle of report code numbers have long used the first edition of this work as a reliable guide. The second edition, doubled in size, reflects the continuous growth of this sector of literature, particularly in the US. The Introduction is required reading, not only for the neophyte at the 'numbers game', but also for the experienced practitioner. The two indexes, one of report series alphabetical codes, the other marrying corporate body to the codes it uses, constitute the bulk of the work; despite being reduced from computer printout, they have excellent clarity and legibility.

HATRICS. Urban transport innovations: a bibliography. Southampton: Hampshire Technical Research Industrial Commercial Service, 1973. 71 pp. £1.50. (ISBN 0 901903 06 X.)

Ever increasing public awareness and interest in planning for urban transport has brought a wealth of enquiries to librarians and information officers for information on new developments in the field. Hatrics' latest bibliography will therefore be a welcome addition to the shelves. It brings together details of 850 publications from a wide range of sources, arranged in convenient subject groups based on mode of transport.

The bibliography will be of interest to technicians involved in designing and assessing new innovations as well as laymen, as it includes details of specialized papers and reports, together with journal articles and books. The sources used for the compilation are international in coverage, though only English language publications are cited; entries cover the period 1967 to August 1972 and details of availability of report literature are given where possible.

As with all bibliographies, publication places an obvious restriction on currency, and in a rapidly developing field no source can hope to be comprehensive. However, the editors have thoughtfully appended a list of organizations concerned with urban transport innovations, for further reference.

WALL, C. EDWARD *and* NORTHERN, B. PENNY. Multi media reviews index 1971: the only complete guide to reviews of non-book media. Ann Arbor (Michigan): Pierian Press, 1972. 382 pp. $25.00 (ISBN 87650 042 4)

This is an annual publication supplemented by regular instalments in *Audiovisual Instruction*. The volume contains some 20,000 citations and cross-references to reviews of films, filmstrips, non-classical records and tapes, slides, transparencies, illustrations, globes, charts, media kits and other miscellaneous media forms. A total of 130 periodicals and services, mostly American, are scanned for reviews in the 1971 volume.

The publication is divided into four main sections: film, filmstrip, record and tape, and miscellaneous media. In each section the entries are listed alphabetically by title and details given include the producer, date released, millimetres, total running time, whether it is sound or silent and whether it is black-and-white or colour. Citations to reviews then follow and an indication is given of how the reviewer rates the item. Full details are given of the periodicals and services scanned including information on their review policies and coverage. Names and addresses of producers and distributors of the media are listed again—mainly all American. There is no index.

Western Australian Institute of Technology

T. L. ROBERTSON LIBRARY

Professional Librarians are required for Acquisitions, Cataloguing and other duties in relation to the Library's $500,000 per annum collection development programme.

Salaries:

Professional Library Officer	Grade I	$A6480–$A8120
	Grade II	$A4895–$A6290

Academic Librarians are also required at Senior Librarian and Librarian level.

Salaries (under review):

Senior Librarian	$A9644–$A11234
Librarian	$A6801–$A 9390

Further particulars of specific positions and method of application from the **Official Secretary, Western Australia House, 115 Strand, London WC2R 0AJ.** When writing please quote AP5. Applications close 16th July 1973.

Library Removals start here

In Bullens planning office.
Every move is planned in detail;
problems of access or timing overcome;
men, vehicles and equipment allocated –
well before the move begins.
So you move safely, quickly and with least disruption.
That's the difference between Bullens
and any other contractor.
Phone today.

Bullens
TRANSPORT SERVICES
Bullens Transport Services Ltd
408, Hornsey Road,
London, N.19 4EB
Tel. 01-272 6671

*Also at Bristol, Hinckley
and Newton-le-Willows.*

A Gillspur COMPANY

British Librarianship and Information Science 1966–1970

EDITED BY H. A. WHATLEY

A review of progress in the late sixties

£8 (£6.40 *to L.A. Members*)

Still available

Five Years' Work in Librarianship 1961–5

EDITED BY PHILIP SEWELL

£5.75 (£4.60 *to L.A. Members*)

THE LIBRARY ASSOCIATION

FIRST for carpets
Dodson Bull

UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display

In our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 68402
BRISTOL: 2-3 Royal London House, Queen Charlotte St
BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LG.
Tel: Southend 46569
9.00-5.30 Mon.-Fri. Sat. 9.00-12 00 (Manchester 9 00-4 00)

ISI's Search Service:

Next best thing to owning your own Science Citation Index®.

Many libraries that don't own the *Science Citation Index* often "rent" the use of it through our *Search Service.*

Just tell us what subject you want searched, which years of the journal literature (1961-73) you want to cover, and how fast you need the search completed. We'll put one of our Information Specialists to work with an *SCI*® and send you the results on convenient index cards. If you're in a big hurry, we'll even telephone the search results.

The minimum charge is $50, for which you get up to two hours of searching. Thereafter, it's $25 per hour. You tell us when to stop.

Use the coupon for more information on *Search Service.*

Please send additional information on ISI's *Search Service.*

Name Title

Organization

Address

City State

Zip Country

Telephone

Institute for Scientific Information
325 Chestnut Street, Philadelphia,
Pennsylvania, U.S.A. 19106
Tel. (215) 923-3300,
Cable SCINFO,
TELEX 84-5305

ISI®

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib

Proceeding

Editorial

Sociology and librarianship *Gerry M. Smith*

Public use of business and commercial information: a pilot study at the Commercial Library, Manchester Central Library *Averil Osborn* and *Leslie Smyth*

A bibliometric survey of primary and secondary information science literature *P. Dansey*

Translations in the UK
Compiled by *Aslib Information Department*

JULY 1973
VOL. 25, NO. 7

HANDLIST OF BASIC REFERENCE MATERIAL IN ELECTRICAL AND ELECTRONIC ENGINEERING

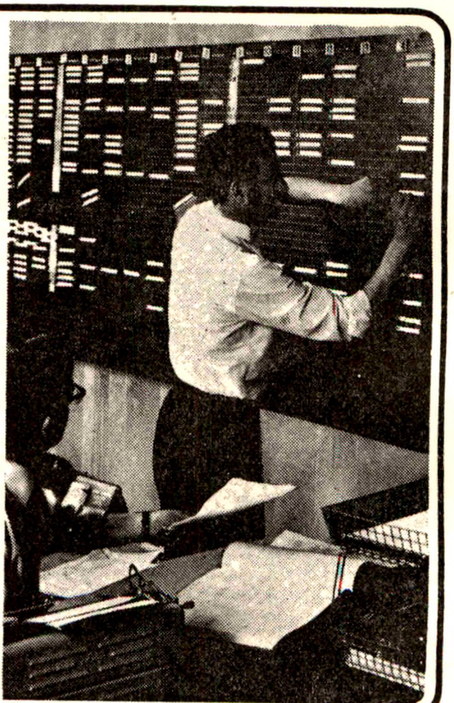
Edited by Ellen M. Codlin, FLA

6th edition, revised and augmented
to take account of our entry into the
Common Market

£2.00 ($5.00)
£1.25 ($3.50) to members of Aslib

Cash with orders please to:

ASLIB ELECTRONICS GROUP,
Craneside, Woolstone, Cheltenham, Glos.



Library Removals start here

In Bullens planning office.
Every move is planned in detail;
problems of access or timing overcome;
men, vehicles and equipment allocated –
well before the move begins.
So you move safely, quickly and with least
disruption.
That's the difference between Bullens
and any other contractor.
Phone today.

Bullens
TRANSPORT SERVICES
Bullens Transport Services Ltd
408, Hornsey Road,
London, N.19 4EB
Tel: 01-272 6671
Also at Bristol, Hinckley
and Newton-le-Willows.

A Gillspur COMPANY

Aslib Proceedings

VOLUME 25 JULY 1973 NUMBER 7

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer-back, Aslib London.

Editorial

The *Conference on the British Library's Services*, held on 16 November 1972, provided an opportunity for the Groups, Branches and Sections of the UK library organizations to review the availability and bibliographical control of various kinds of documentary material in this country, and a number of suggestions were made on ways in which the British Library might be expected to make good suspected deficiencies.

Since then the Aslib/Institute of Information Scientists/Library Association Working Party on the British Library's Services has been examining, in greater detail, certain classes of document, e.g. translations, reports, theses, standards, patents, etc., on which specific comments were made. As a basis for discussion, brief statements were prepared on each category of material in order to identify the main problem areas.

In some categories it has proved possible to provide a fairly complete picture of the present situation and in these cases it was felt that this information should be made available to a wider audience, if for no other reason than that discussion at the November conference revealed that not everyone was fully conversant with existing facilities.

The first of these summaries appears in this issue of *Aslib Proceedings*. It concerns translations and has been compiled by the Aslib Information Department in consultation with other agencies. No doubt there are some omissions, and Aslib would welcome comment on these (addressed to the Information Officer, please), but in general the statement indicates that although problems still exist in this area they are by no means major ones, and their solution lies more in the direction of greater co-operation amongst producers of translations than in the introduction of more refined control systems.

The second area on which a statement is likely to be available is that of report literature and this we hope to reproduce in our next issue.

CALL FOR PAPERS—Aslib's 'Jubilee' Conference, 22nd–25th September 1974

Aslib's 48th Annual Conference, to be held from 22nd–25th September 1974, at Churchill College, Cambridge, will have its part to play in the Association's 50th Anniversary year. It is hoped that the social programme and the final session on Wednesday, 25th September, will be devoted to Jubilee Celebrations, but in planning the programme every effort is also being made to ensure that the conference itself is memorable without dwelling nostalgically on fifty glorious years of specialized information.

The theme that has been chosen is extremely practical—'Tools, techniques and sources'. Four main sessions will be introduced by some very distinguished speakers who have been asked to give a wide ranging review of their subject, not necessarily strictly confined to the information scene. Aslib members are then invited to submit papers on more specialized aspects of the four main topics, as indicated in the following programme outline.

PROGRAMME AND SCOPE

Session 1: Publication today and tomorrow: national and international publishing in relation to the dissemination of information in all disciplines.

Speaker: Alex Jarrett, Managing Director, IPC.

This paper will look at present methods and limitations in presenting material and examine the problem areas as well as new developments in publishing techniques at a local, national and international level.

Four submitted papers to follow on subjects as indicated:

New developments in primary publications: availability and acceptability of microforms; developing personal networks; access to unpublished information; new tools of the trade (e.g. data centres); copyright and microforms; preprint exchange networks; secondary and announcement services on tape (booklists, abstracts, the use of MARC); measuring the *real* use of publications.

Session 2: Compiling and presenting information for maximum impact.

Speaker: Major-General Sir Kenneth Strong, KBE, CB, from 1948–64 Director of Joint Intelligence Bureau, Ministry of Defence.

This paper will be concerned with information handling and presentation in its broadest sense, with the need to identify the message to be conveyed and the art of presenting it in the most effective way possible to the audience concerned.

Four submitted papers on subjects in the following field:

Analysing enquiries—their motivation and purpose; assembling and synthesizing information; presenting information; monitoring use made of information supplied and its value to the organization.

Session 3: Access to information—resources of the United Kingdom.
Speaker: Dr H. T. Hookway, Chief Executive, British Library.
Four submitted papers in the following field:
Access through Aslib or similar bodies; document and information resources of the national libraries; information centres in the UK; use of local resources—from the public library to the Citizens' Advice Bureaux; referral services.

Session 4: Access to information: international co-operation. Foreign and international resources.
Speaker: A. A. Winters, NOBIN, Chairman of the OECD Committee on Information.
Four submitted papers in the following field:
Recent developments in abstracting journals and indexes; effective use of mechanized bibliographic and search services and difficulties of communicating with them; getting information from EEC countries; from USA; from Japan; from the Communist countries.

The 1974 Annual Conference 'ad hoc' committee (Dr W. E. Batten, M. W. Hill, NRLSI (Holborn Division)), J. S. Rippon, the Metal Box Company, and R. Sewell, British Steel Corporation (Swinden Laboratories), with any additional advisers they may decide to co-opt, will review the submitted papers. Intending authors should submit a summary (up to three hundred words) of their proposed contribution, which should reach the Conference Organizer, Aslib, 3 Belgrave Square, London SW1X 8PL as soon as possible and not later than 30th September 1973. Authors of selected papers will be asked to provide a full text which will be preprinted and distributed to all participants in advance of the conference.

Sociology and librarianship

Gerry M. Smith

Assistant Librarian (Information Officer),
The City University

Paper presented at a meeting of the Aslib Social Sciences Group, 7th May 1973

Introduction

The Aslib Social Sciences Group was established in 1969 to promote the study of two distinct subject areas: (a) the bibliography and handling of the literature of the social sciences; and (b) the application of social science methods to librarianship and information work. The major effort of the Group has, rightly in my opinion, been centred on bibliographical issues; the aim of investigating the social sciences for their relevance to librarianship has been served by two excellent papers, on the relevance of psychology[1] and politics to librarianship. I want to try to add to the valuable insights of these two papers by looking at the potential contribution of a sociological perspective to our understanding and effectiveness as librarians. I am using the definition of sociology used in Worsley's introductory textbook: 'A way of looking at man's behaviour as conditioned by his membership of social groups.'

As sixty minutes does not permit a worthwhile examination across the vast area of relevant sociological activity I will restrict my discussion to four substantive areas of study—education, mass media, sociology of knowledge, and librarianship as a social activity. These are, I hope, areas of interest to this group, drawn largely from academic and special libraries. I have excluded numerous other interesting areas of relevance primarily to public librarians. The aim in the first part of the paper is to see what sociological information and insight could be applied directly or by analogy by librarians; the second part of the paper provides a checklist of ideas which could form the bare outline of a sociology *of* librarianship.

Education

The study of educational institutions from a sociological perspective, their structures, goals, ideologies, etc., yields an abundance of useful information for librarians serving such institutions. To consider universities as an example, it is generally accepted that major organizational goals are the transmission and creation of knowledge, i.e. teaching and research. However, in planning a university library service this information in itself is of little value—it is necessary to know to what extent different ranks of academics in different disciplines at different kinds of university give precedence to each activity. Halsey and Trow's recent study of British academics[2] helps us to understand how these complementary, though often conflicting, goals are pursued throughout the academic world. Their analysis shows that only 10 per cent of academics are interested primarily in research, while 54 per cent are interested in both, with leanings towards research; the remaining 36 per cent are interested in both, with leanings towards teaching; and that a research orientation is more pronounced at Oxford, Cambridge and London Universities, among professors, readers and younger lecturers, and among those in arts and natural science departments; conversely 'older' lecturers in technological departments of former CATS tend to be less research-oriented. Halsey and Trow's study presents a curious irony: there seems to be an inverse correlation between academic standing/published output of British universities and the reputation of their library services (at least in progressive library circles); many of the former CATS, for example, while having the lowest relative prestige and published output, seem to be making some of the more important contributions to the range and standard of services accepted as normal in academic libraries.

Another area relevant to the provision of academic library services would be to examine the consequences for librarians of student attitudes and motivation. It is claimed, particularly in the popular press, that the changing values of many university students—exhibited mainly in militant campus political activity—is a direct result of the increase in the numbers (though not the proportion) of students of working-class origin. A former university librarian is on record as wondering whether this is a contributory factor in the apparent increase in theft from libraries;[3] attitudes such as these certainly deserve further investigation. It would be instructive to know the motives of students attending institutions of higher education—how far they are instrumental (a means of social mobility, to satisfy parents, teachers or peers) or affective (purely for the sake of exercising the mind in an attractive environment). The pattern of library use of the individual student probably depends to some extent on his reasons for being in the university in the first place.

When we look at numbers of people being educated it is clear that Britain, following the US and other industrialized countries, is moving from an élite towards a mass higher education system: to a situation where a significant percentage of each age group will experience formal higher education. Unfortunately, we have little idea of the pressures that such an expansion in numbers will have on library accommodation, collections and services offered. Do we simply try to increase all resources by the same factor as the increase in student numbers, or is the relationship rather more complex? Will there be a much greater need for reader instruction, as some writers have suggested? In essence, is there a qualitative difference in running effective library and information systems for much larger numbers, as well as a purely quantitative one?

This fragmented introduction to the study of a university as a social institution could, of course, be expanded and extended to cover all the other types of educational institutions—the study of the school as a social system already has a formidable literature base.

Mass media

Although the sociological study of the mass media is, in Britain at least, a relatively new field of enquiry, some of the empirical research findings raise important questions for librarians, who are also engaged, though differently and to varying degrees, as processors of information.

The Centre for Mass Communications Research at Leicester University has shown, by means of a controversial case-study (a detailed investigation of the mass media treatment of the anti-Vietnam War demonstration held in London in October 1968[4]), that current affairs reporting is characterized by 'selectivity, accommodation of existing frameworks, lack of variety across the media, heavy stress on events and on negative aspects and the lack of background material'. The same team is currently investigating the mass media coverage of the Northern Ireland issue. As an untiring 'Northern Ireland watcher' (and a former resident) I would expect their conclusions to be broadly similar to those of the earlier study. Given these findings, it is clear that the 'world picture' presented by the mass media is not sufficient to allow people to make informed decisions—the essential prerequisite of a fully democratic society. I have argued elsewhere[5] the implication for public libraries (especially). It is that they should complement the mass media in the documentation of current affairs by providing ready access to a wide range of primary documents—material produced by involved pressure groups to provide detailed, current, first-hand information on social, economic and political phenomena of contemporary national concern.

Another pioneering study,[6] on the structure of foreign news reporting, indicates that the reporting of foreign news tends to be extremely selective, and that the selection is dependent on several factors, such as the physical distance of the nation where 'newsworthy' events occur, the ambiguity of the event, the negative value of the news, the cultural distance of the society, the rank of the nation, the rank of the people to whom events happen, and the unpredictability of the event. It appears, therefore, that libraries with responsibilities for collecting material on international affairs could overcome the shortcoming of the mass media by stocking at least some material selected according to alternative criteria.

I would like now to turn from the direct implications of mass media sociology for collection-building to an analogy. The role of the autonomous book selector with a limited budget is, in many ways, analogous to that of a newspaper editor or television news producer: each selects from an almost infinite 'output' and presents the selection as a relevant approximation to the needs of his consumers. This being the case, it could be very useful to adapt the techniques and perspectives employed in the study of the news selection process to a study of book selection processes. It may be demonstrable, for instance, that the attitudes and values of a book selector have a serious, though unintended, effect on collection-building; that, for example, the book-stock assembled in a university business school library by a librarian with liberal/radical values and a sociological academic orientation had become strong in the behavioural sciences and industrial relations and remained relatively weak in marketing and financial management, despite an explicit policy to develop all relevant subject areas at the same level of comprehensiveness and currency. Having determined the effect of ideological and academic preference, it would then be a relatively easy matter to incorporate correctives into the selection process.

Objective research into the effects of the mass media, though by no means definitive, supports the conclusion that the media reinforce rather than form attitudes and that they have this effect gradually, over a period of time. The theory that the mind is a *tabula rasa*, on which all messages received have a roughly equal effect has been rejected in favour of an 'interaction' model, which claims that individuals receive messages via a complex 'filter', that they are selective in the messages they accept, and that the more authoritative the source the greater is its influence. If the same communications model is applicable to library situations, it has an important implication for a realistic analysis of the effect of libraries: our collections and services will have a very limited causative influence on attitude formation and change, as people will tend to use libraries to select those items which will reinforce existing attitudes and values. The hopes that the spread of public libraries could encourage the spread of liberal, humanistic attitudes can thus be challenged.

A study of the sociology of the mass media, as an aid to the comparative study of libraries and in helping to delineate those weak areas in which libraries could perform a complementary role, is thus a potentially rewarding one and merits further investigation.

Sociology of Knowledge

I want to turn now to my third substantive area—some aspects of the underdeveloped sociology of knowledge. A study of the technical processes in the production and distribution of printed information is usually included in library school curricula; the study of the social processes involved tends to be ignored. Areas of interest to librarians are the sociology of literature (including the study of academic publication as a social process and the sociology of reading) and the study of values and attitudes associated with knowledge, or information.

The sociology of literature attempts to answer such questions as: 'Who writes different kinds of literature?'; 'Who evaluates the literature and attempts to form attitudes to it in a wider public and with what effect?'; 'Who reads the different types of literature thus made available and with what consequences?' Although there is a large amount of interesting information on the social characteristics of authors, I would like this evening to restrict my remarks to a glance at academic publication. Indications of the pattern of authorship of academic publication are to be found in Halsey and Trow's study referred to earlier. It shows that, although only 7 per cent of British academics had published no academic articles, nearly half had published ten or more; the median output was nine published articles. More surprisingly, 65 per cent of their sample had not had a book published; a further 18 per cent had published only one. When we consider that the average career of a university teacher must be at least ten years, it seems that the popular stereotype of academics as prolific writers is not, in many cases, appropriate.

The success of all writing depends to some extent on the mediation of opinion leaders—publishers and literary critics in the case of 'creative' writing, editorial boards and referees in the case of academic journal articles. Investigating the selection process for articles published in a very small sample of

American social science journals, Diana Crane concluded that 'the distribution of characteristics such as academic affiliation, doctoral origin and professional age of contributors to scientific journals is similar to the distribution of these same characteristics among journal editors; anonymous evaluation of articles does not change this relationship. It appears that the evaluation of scientific articles is affected to some degree by non-scientific factors.'[7] The most significant factor is probably the similarity of academic orientation resulting from a similar academic background. It would be interesting to investigate another process of selection of academic writing, that of selection for review of books received by academic journals. A recent issue of the *American Journal of Sociology* reviewed less than 8 per cent of books received; surely one of the major factors in perpetuating the lag in the knowledge of academics about new publications in their field?

Escarpit[8] concludes that literary recognition on a world-wide scale is accorded by 'a small, highly-educated, well-connected elite in the major industrialized nations: a bare ten or fifteen million people'. The mediation of such a narrow opinion-leading group may lead to a startling lack of knowledge about most published work; a recent study concluded that the writers retained in the French historical memory comprised only 1 per cent of the total number of authors published. Other studies[9] have concluded that the number of writers thus retained in the memory includes about the same proportion of living and dead authors—knowledge of the output of, say, thirty years is roughly equal to that of the output of several centuries! The rate at which authors are forgotten produces a similarly staggering picture: about 90 per cent of books are forgotten after one year, about 99 per cent after twenty years.

Librarians interested in the sociology of reading are indebted to the work of Dr P. H. Mann of Sheffield University; a number of short books and articles[10] have provided a very credible insight into such vital questions as who reads what, why and where they obtain their reading material. Summarizing such excellent and readily available material seems rather pointless. The work is mentioned here to stress that it occupies a central place in any study of sociology for librarianship.

A library-oriented sociology of knowledge is also capable of telling us something about the attitudes and values developed towards science and other sectors of academic knowledge. S. R. Rothman, in a recent paper,[11] argues forcibly that the traditional scientific ethos, consisting of 'universalism, organized scepticism, communality, ethical neutrality and disinterestedness' is in need of re-examination. Librarians in academic communities, especially those operating information services, would certainly be aided in the appreciation of their social role by developments in the sociology of scientific knowledge. All thinking librarians would be aided by systematic studies of the attitudes and values that different groups of people have towards different types of information in different formats. To take an example, the typical university teacher, it is said in a recent study,[12] spends 9.5 hours per week on such 'unallocable internal activities' as keeping up-to-date in his subjects. How many academics are, in fact, as up-to-date as is possible? I wonder how much of the publication in a field is missed by the selectivity of the information sources used?

Librarianship as a social activity

Having briefly examined some of the candidates for inclusion in a sociology for librarians I want to continue by examining some of the elements of a sociology *of* librarianship. I will cover recruitment and the concept of professionalization. Because of time constraints I neglect the equally interesting areas of role analysis, occupational socialization and career patterns.

Now that most librarians have to go through a full-time course of education, the most useful starting point for a study of recruitment to librarianship is the Library Association's annual census of full-time librarianship students. It shows, for instance, that 44 per cent of the students intending to enrol for the session 1972/73 were graduates, and that 25 per cent of students on full-time courses at March 1972 were male.[13] It would be instructive to compare the male/female ratio with those of the last ten years in order to establish trends. The graduate/non-graduate ratio, while obviously important, is not the only relevant educational variable: it would also be useful to know what type of school—state or private—the population attended; what the subjects of the graduates' degree were (this, for instance, could verify or refute the widespread assumption that the overwhelming proportion of graduate librarians possess arts degrees; an analysis of the academic standard of the graduate population (crudely measured by analysis of class of degree) would also be useful. Details of ascribed social class of entrants to the occupation would also be interesting: the present writer suspects that a large percentage of recruits could be described as lower-middle class (measured by occupational status of father). Sex, education and class factors contribute to the image that an occupational group presents to the wider world and may lead to a restriction of types of people perceiving librarianship as a possible career choice. It would be instructive to determine what other factors influence particular groups of people to choose librarianship as an occupation; what percentage of entrants regret their decision after, say, five years; what percentage leave the occupation (for reasons other than maternity)? Data of this kind would be useful in demonstrating the validity or otherwise of the stereotype of the librarian revealed in the unflattering comment of Anthony Howard, editor of the *New Statesman*, reported in a newspaper interview: 'After he had failed to become president (of the Oxford Union) at the first attempt, he thought he had failed in everything and sank so low that, as he puts it, he even inquired about a career in librarianship';[14] portrayed in films (e.g. *The Spy who came in from the cold*, and *Only two can play*), and various cameos seen on television series such as *Z Cars*. Such a social profile of recruits to the occupation would, of course, be enhanced by comparative data on the distribution of these variables amongst librarians in different types of library.

An objective, well-grounded analysis of the extent to which the occupation can be described as a profession is long overdue. The results of such an analysis would, if nothing else, render obsolete the frequent, unrealistic statements and pleas appearing in the correspondence columns of the librarianship press. A more useful result would be to provide potential entrants to the occupation with objective data to compare with their own conceptions of the occupation and that of advisers.

Specialized occupations such as librarianship are the product of an advanced industrial society—many thousands of white-collar occupations simply did not exist until relatively recent times. Most aspire to professional status. The extent to which a white-collar occupation can be classified as a profession depends on the possession of a wide number of related characteristics (although sociologists are far from agreed on what exactly these characteristics are, or on their relative importance). Most fully professional occupations are characterized by a code of ethical conduct, both formal and informal. Librarianship has no written code which new entrants swear to uphold—there is no equivalent to the Hippocratic Oath! The occupation does, however, possess an unwritten code—most librarians assume an emotional neutrality to readers, irrespective of status, age, sex, politics, race, etc.; there is in most librarian–reader relationships an element of disinterest on the part of the librarian—there is no ulterior motive or gain from the transaction (as opposed to, say, the 'advice' of a salesman in a furniture showroom); there is an unspoken belief that inter-librarian behaviour should be co-operative, and supportive—certainly in my initial approaches to other librarians I expect these attitudes (although disappointment is frequent); librarians tend to place great value on being able to refer users to more specialized contacts, hence the large numbers of specialist librarian groups and the keenness to attend conferences. Librarians are professionalized in the extent to which they are part of a shared professional culture, which can be described as follows: most believe in the essential worth of the service they offer; there is a consensus about the correct ways of treating customers and clients; librarians have stereotypes of colleagues ('dedicated' is a description often encountered) and customers (for example, that students often display a profound ignorance of literature sources and information gathering techniques); a particular job is seen as a component in a career; the more profession-oriented librarians are emotionally involved in their work (there is a spill-over between work and leisure activity which, at the lowest level, consists of reading the *Library Association Record* once a month); finally, librarians belong to specialized bodies which exist for the advancement of their skills and force them through a common educational process. Contrast these characteristics with the occupational culture of, say, a bank clerk.

Librarians thus score highly on a few generally accepted criteria of professionalism. On many other criteria they score less well. Established professions apply a systematic body of knowledge to problems highly relevant to the central values of society; their knowledge base consists of theoretical concepts as well as practical techniques which apply the theory to specific problems. Accepting the role of librarians as the collection, arrangement and exploitation of (mainly printed) information, what is the theoretical basis of, say, book selection? Knowledge of bibliographical sources and understanding of what the parent organization needs to have selected from the total published output are merely techniques—they have at present no theoretical basis. The exploitative function —reference service, current awareness and the teaching of library use—has at present little theoretical foundation. Organization and administration of library services is another field currently barren of theory. To my mind only classification, cataloguing and indexing possess a theoretical basis. If librarianship is to develop a systematic body of theory, it would seem to lie in the synthesis of relevant areas of accepted academic subjects such as the social sciences and some of the functional management areas. Such a body of theory will not, of course, evolve without a substantial increase in (and redirection of) the current research effort of librarians and interested specialists from other fields.

Partly as a result of inadequate educational programmes, librarians lack a second major attribute of fully professionalized occupations—professional authority, or recognition by non-librarians that librarians possess specific knowledge on the basis of which the layman is prepared to rely on specialized advice. Examples of this lack of authority spring readily to mind: the absence of substantial numbers of librarians on top-level government committees looking into problems of librarianship (e.g. the Dainton Committee); the oft-quoted sentiment in academic library circles that academics think they can run libraries (and the institutionalization of this belief in the existence of Senate Library Committees) and the conflict over book selection in some academic libraries.

Other negative factors appear to be lowish average salaries; an intake which is, relatively speaking, not well qualified academically (though this is changing with the increasing proportion of graduate entrants); a disproportionate number of women (which in most occupations, unfortunately, tends to lower the wage-bargaining power and the general attraction of the occupation to men). The ascribed social class of librarians seems to be lower than that of most fully professionalized occupations (for example, I would expect the social class origins of librarians in most sectors to differ from that of accountants, architects and lawyers, and to be similar to that of school teachers and journalists). The most significant negative attribute in assessing the degree of professionalization is the social function of the occupation. Unlike medicine, which nearly everybody needs at some stage in their lives, and which, therefore, has a central social importance, librarianship can be viewed as a marginal occupation—most people do not use libraries and those who do use libraries could, if necessary, probably be served by alternative methods. In sum, the withdrawal of libraries would not do most people measurable harm.

Comparative studies of the professionalization of librarians in other countries would be a useful complement to a detailed study of the degree of professionalization of UK librarians. Goode's American study[15] concluded that librarians in that country could not achieve full professionalization. A comparative study would establish whether Goode's study was culture-specific (i.e. relevant only to the USA). The recent UK entry into the Common Market presents an opportune moment for a comparison of the relative professionalization of British librarians and their European counterparts. (A very small-scale study of the comparative occupational status of participants in the Conference of European Business School Librarians is currently being undertaken by Neil Hunter, of Bradford University, and myself.) Any detailed analysis of the concept of professionalization would need to be based on two key premises—that one is investigating the degree of professionalization (not whether or not the occupation is a profession), and that professionalization is a dynamic process—changes in the occupational structure can lead to changes in the relative status of occupational groups.

Conclusion

To sum up, I have attempted to examine a few sociological sub-disciplines for their relevance to librarians; I have missed out those sub-disciplines such as the family, work and leisure, urban sociology, race relations, etc., which are relevant mainly to public librarians. I hope to have demonstrated, nevertheless, that the development of a specialized sociology for and of librarianship would be a worthwhile, if daunting, undertaking. Personally, I feel that the technical expertise possessed by librarians would be greatly enhanced if it were supported by a detailed understanding of the social environments within which all librarians operate.

REFERENCES

1 LINE, M. B. On the design of information systems for human beings. *Aslib Proc.*, **22**, 7 July 1970.

2 HALSEY, A. H. *and* TROW, M. A. *The British academics.* London: Faber, 1971.

3 LINE, M. B. Some notes on book stealing. *Libr. Assoc. Rec.*, 71, 4, April 1969.

4 HALLORAN, J. D. *et al. Demonstrations and communication: case study.* Harmondsworth (Middlesex): Penguin, 1970.

5 SMITH, G. M. The documentation of current affairs in public libraries. *Libr. Assoc. Rec.* 73, 9, September 1971.

6 GALTUNG, J. *and* RUGE, M. H. The structure of foreign news. *J. Int. Peace Res.*, 1, 1965.

7 CRANE, D. The gatekeepers of science: some factors affecting the selection of articles for scientific journals. *American Sociologist*, **2**, November 1967.

8 ESCARPIT, R. The sociology of literature. *In: International Encyclopaedia of the Social Sciences*, Vol. 9. London: Cromwell, Collier and Macmillan, 1968.

9 Reported by Escarpit, *op. cit.*

10 *See, for example:* MANN, P. H. *The romantic novel: a survey of reading habits.* London: Mills and Boon, 1969; *Books: buyers and borrowers.* London: Deutsch, 1971; Some aspects of the sociology of book reading. *Educ. Libs. Bull.*, 4, Summer 1971. (With BURGOYNE, J. L.) *Books and reading.* London: Deutsch, 1969.

11 ROTHMAN, R. A. A dissenting view on the scientific ethos. *British Journal of Sociology*, **23**, 1, March 1972.

12 COMMITTEE OF VICE-CHANCELLORS AND PRINCIPALS. *Report of an enquiry into the use of academic staff time.* 1972.

13 The latest 'Annual census of full-time librarianship students' is published in *Libr. Assoc. Rec.*, 74, 5, May 1972.

14 COLEMAN, T. Howard's endgame. *The Guardian*, 29th April 1972.

15 GOODE, W. The Librarian. from occupation to profession? *Lib. Q.*, 31, 4, October 1961.

Public use of business and commercial information: a pilot study at the Commercial Library, Manchester Central Library

Averil Osborn

Formerly Aslib R & D Department, now Social
Services Research Officer, Westminster City Council

Leslie Smyth

Commercial Librarian, Manchester Central Library

PART ONE: THE SURVEY

by Averil Osborn

Introduction

One of the main difficulties in operating a service for the public is that the public, though very much in evidence individually, may collectively be an unknown quantity. When the service is one offering business and commercial information the difficulties are compounded. The field is fluid, the literature extensive and its acquisition complex. Much of the material quickly becomes out of date. Furthermore, the seeker of business and commercial information has, or may have, many strings to his bow and the part played by any single formal information set up is not obvious.

This situation offers many exciting possibilities for research but as yet very little has taken place. For instance, one could explore the whole business and commercial information environment of pre-defined user groups in order to ascertain the role played by the publicly available systems. A different and more immediately useful approach could take the formal organization as its entry point. In this case the users would be identified by their active use of the service under scrutiny and a picture would emerge of the use and users of that service. This was the manner in which the Aslib study was designed. It aimed to investigate the use made of publicly available business and commercial information services. The survey was to be piloted at the Commercial Library of the Manchester Central Library and a larger scale London study was to follow. Though the Manchester study formed the vanguard of a larger project the results are naturally valid in their own right and were felt to be sufficiently interesting to present here.

In fact the presentation will be in two stages. Firstly, as the researcher responsible, I would like briefly to describe the survey aims and methodology; followed by a description of the main results. Leslie Smyth, the Commercial Librarian at Manchester, will then take up the tale. Having an intimate and longstanding knowledge of the library under scrutiny, his comments and interpretations will help put the research into context.

Aims

What did this user study try to establish? Background data was already available concerning the library itself.[1] The survey aimed to provide a picture of its use and users. This would reveal something of the identity of the library's public, help to explain a little about the things they wanted from the system, and give a picture of the extent of their use and the alternatives they felt were available to them.

Data on the quantity of use, defined crudely as the numbers of visits made and the numbers of telex, postal and telephone enquiries received, was collected by holding counts on test days. The quality or type of use was investigated by questionnaire. Both personal visitors and telephone enquirers were involved. Letters and telex requests were also examined but, being few in number, will not be discussed further here.

The information solicited from the users fell into four main areas:

(a) General information to identify the user by employing organization, job and work location.
(b) Information regarding the use of this and other formal business and commercial information services.
(c) Information concerning the cause of the visit/call when recruited—details of the type of information sought, time spent, satisfaction and so on.
(d) General comment on information provision and problems in this area.

The survey was fairly unusual in that it pursued the telephone enquirers and the personal visitors with an equal vigour. All too often it is 'out of sight, out of mind', despite the fact that the telephone enquirers account for a substantial proportion of the use made of the system and are most demanding of staff time.

Method of investigation

On the selected test days all users were presented with a questionnaire and a reply paid envelope as they entered the library. Counts were kept of those who refused or who had already taken part on a previous visit. Similarly the library staff sought to recruit all those telephoning the library during this period. The names and addresses of those agreeing to co-operate were noted and a slightly modified questionnaire dispatched to them the same evening. A count was kept of all those refusing to take part.

Sampling

There is no statistical validation for our method of recruiting users. The choice was essentially made on practical grounds: the survey staff must be deployed economically, disruption to the library must be minimized, a target number of returned questionnaires should be obtained. This led us to favour total coverage of users for a selected period of days. Seasonal, daily or other variations in use, though suspected, were not really known and, out of convenience, three consecutive days in July were chosen. This was not only the holiday period but it also coincided with a quite exceptional heat wave. At its peak the temperature reached 21.1°C in the shade, that is the mid-eighties fahrenheit. This was hardly the best time for fieldwork, as the untypically low figures of use rapidly confirmed.

The average traffic during this period was as follows: visitors averaged 340/day and telephone calls 53/day. I will leave Mr Smyth to comment more fully on this in Part two of this paper.

The response rates were a good average for this type of information use study.[2] 48 per cent of all visits (including those by people who had already co-operated, who refused, or who were missed) and 49 per cent of all telephone calls produced usable questionnaires. The actual number of telephone enquirers (78 recruited) was well below that of the visitors (488) and in retrospect one would have liked to have taken steps to boost the former, perhaps by allowing these a longer recruitment period.

Analysis

The questionnaire was designed for self-completion and quick analysis. The questions were largely pre-coded. The few open ended ones were analysed manually. The bulk of the questions were analysed by computer. A Cybernet package SPS (Survey Processing System) was used, operated from the Aslib terminal. A hole count and all the necessary cross tabulations were produced efficiently and economically. Though standard statistical tests were available it was felt that these may give the results false validity as interpretation of the results and generalizations from this data depend largely on subjective assessment of the representativeness of the sample, both in terms of selection of test days and the response rate achieved.

Results

Who are the library's public?

As Table 1 shows, a fifth of the respondents had no employing organization. Those who argue that all business and commercial information should be provided by the firm are therefore instantly dismissing the needs of a large group of people. On the other hand, those with firms to turn to were obviously not self-sufficient. The manufacturing industries and the professional or consultancy services were responsible for the largest numbers of users. In fact 42 per cent of all telephone enquiries emanated from the former.

One might suppose that work location (for those in employment) would divide the visitors from the telephone enquirers. The visitors were indeed more clustered with the City of Manchester itself, 41 per cent of employed callers but 67 per cent of all employed visitors working there. However when the area within a ten mile radius of the city centre was examined it was seen to encompass a similar portion of each, 82 per cent of callers and 87 per cent of visitors. The personal visitors tend therefore to work nearer the library but this trend operates over a very limited distance.

As Table 2 shows, of all the employed groups listed the 'professionals' placed most demand upon the system in terms of numbers of visits or calls, over a third of the respondents placing themselves in this category.

The respondents use of this and other library and information services in general

Half of the respondents had access to a useful library at their place of work, 29 per cent knew other publicly available services they could use and 44 per cent could call on useful services through membership of the bodies concerned. Only a third felt this service to be the only one at their disposal. The telephone callers tended to have their fingers in more pies than did the visitors.

TABLE 1: *Type of contact by employer group*

	METHOD OF CONTACT		
	Total	*Personal visit*	*Phone call*
Total	566	488 (86%)	78 (14%)
EMPLOYER GROUP			
Manufacturing industry	102 18%	69 14%	33 42%
Transport/communications	28 5%	24 5%	4 5%
Distributive trades (wholesale, retail)	43 8%	36 7%	7 9%
Financial (banking, insurance etc.)	58 10%	50 10%	8 10%
Professional or consultancy services (Accountancy, legal etc.)	110 19%	97 20%	13 17%
Government	53 9%	52 11%	1 1%
Education	42 7%	38 8%	4 5%
Other	20 4%	16 3%	4 5%
None	113 20%	109 22%	4 5%

Three people gave more than one answer.

Quite a large number of respondents—about a tenth—were contacting the library for the first time. A further half could be considered to be heavy users, either contacting the service at least once a week or in less regular but more intensive bursts. We are here looking at the volume of visits and calls made rather than the degree of use to which the library is subjected during any one such contact.

There were slightly fewer heavy users in the telephone enquirer group than in the visitor one.

What picture of use emerged from the questionnaire 'spot check'?

How much value is business and commercial information to the individual as opposed to the firm? Quite valuable according to our results. The split between work-related and personal use was about fifty-fifty for the visitors, but for the telephone enquirers work-related queries predominated (86 per cent). Most of the visitors were there on their own behalf but as many as a third of the telephone calls were delegated to the caller by someone else.

Did the respondents turn to the library immediately or had they already explored other avenues without success? Two thirds of all respondents brought their problem straight to the library, the remainder had already tried approaching other libraries or organizations, looked in their files, records or notes at work, asked other individuals for help, or done several of these things. The telephone callers were more likely than the visitors to have already looked for the information, most usually in files, notes or records at work.

TABLE 2: *Type of contact by job of user*

		METHOD OF CONTACT	
	Total	*Personal visit*	*Phone call*
Total	566	488 (86%)	78 (14%)
JOB TITLE			
Administrator/manager	89 16%	74 15%	15 19%
Clerical/secretarial	60 11%	40 8%	20 26%
Sales	72 13%	63 13%	9 12%
Professional	208 37%	181 37%	27 35%
Student	65 11%	65 13%	0 —
Other (inc. retired)	74 13%	67 14%	7 9%

Some double coding occurred. The professional group includes teachers, accountants, economists, librarians, information officers and the like.

The searches on the whole did not consume vast amounts of time. Three quarters of the visitors had terminated their searches within fifteen minutes, nearly all (96 per cent) of the searches made by the library staff on behalf of the telephone enquirers were completed in this time. Smaller groups of visitors may, of course, have taken much longer. For instance, a tenth of the visitors searched for an hour or more.

One is aware of an atmosphere of urgency within this type of library. The telephone rings incessantly and the users rush rather than stroll in and out. Is this an indication of the limited time available or the immediate need for the information the library has to offer? It is probably quite impossible to separate these factors. However, it does seem that a proportion of the information was needed urgently. Over a third of the respondents (36 per cent) claimed to need the information by that or the next day for it to be of use, whilst a further quarter said they must have it within the week. The telephone enquirers were under more pressure on the whole than were the visitors.

The fairly high level of urgency and the very reasonable time spent searching for the data leads one to wonder how successful these particular interactions with the library were. Satisfaction was actually quite high—only 5 per cent of the respondents achieved nothing at all. Seventy-one per cent either found sufficient to keep them happy or gained even more than they had expected—a bonus effect. The telephone enquirers were more likely to be satisfied than the visitors—only one in six callers obtained a partial answer or no answer at all, whilst about one in four visitors were not fully satisfied.

TABLE 3: *Type of contact by areas of interest*

		METHOD OF CONTACT	
	Total	*Personal visit*	*Phone call*
Total	566	488 (86%)	78 (14%)
AREAS OF INTEREST			
Product information	87 15%	75 15%	12 15%
Market information	125 22%	118 24%	7 9%
Management information	44 8%	36 7%	8 10%
Import/export information	45 8%	35 7%	10 13%
Companies information	195 34%	155 32%	40 51%
Statistics	61 11%	54 11%	7 9%
Maps	32 6%	32 7%	0 —
Timetables etc.	90 16%	74 15%	16 21%
Other	74 13%	69 14%	5 6%

More than one area may be of interest.

Which areas were of interest? Setting aside problems of definition, Table 3 shows how the respondents classified their interests.

Company information was most popular—of interest to a third of the users. Then came market and product information and the quick reference material such as timetables, guides and so on. Differences between the telephone and visitor subgroups were again apparent. For instance, the former needed much more company information and less market data than the latter.

The personal visitors provided some information about the way they intended to use the library. On the whole they tried to locate books or other documents they already knew of (59 per cent), or tried to find specific facts by their own searching (33 per cent). A fifth of them thought they would browse. Fifteen per cent decided to ask for staff assistance immediately, 16 per cent eventually did so, but the majority were confident that they could cope alone. They found the directories and yearbooks most generally useful, of use indeed to 43 per cent of visitors, followed by journals and periodicals. Other types of material were still of use but to fewer numbers.

The telephone enquirers gave various reasons for their choice of library. After all the telephone gave them potential easy access to a wide range of services. The majority were regular users of this service and had a knowledge of the areas it covered and the stock it held. They felt the advantages of telephoning far outweighed such disadvantages as there were in not visiting personally.

Respondents views on business and commercial information problems generally

Perhaps the most significant fact to emerge here was that the majority expressed the opinion that they had no problems in this direction. The 'public' on the whole seemed well pleased with their lot. Indeed many of the comments given revealed a great affection for the library and an appreciation of the services it provided.

PART TWO: INTERPRETATION AND COMMENTS

by Leslie Smyth

A study as well conceived and perceptive as this, is valuable in providing confirmation of what has previously been only supposition. It analyses, clearly and cogently, aspects of use largely unknown, brings to light various shifts in demand and indicates the way for future policy. Furthermore, in the present highly management conscious era of local government, it provides a quantative assessment of function which is much more convincing than abstract value judgements.

Previous knowledge of users and use of the Commercial Library was limited to personal observation and the results of two censuses of readers taken in 1954 and 1964 respectively. Except for the completion of the statutory photocopying forms, users are not asked to fill in any forms or identify themselves in any way, so, in this respect, we know less about our readers than do most libraries. On the other hand, business users tend to be more expansive than average and one is inevitably involved with their various problems. The census of readers was designed to cover all people entering the Central Library building as well as individual departments. It asked only for place of residence, occupation, sex, educational institute attended if appropriate and comments on the service. An interesting indication of the difference in emphasis between the census and the Aslib Study is that the former found that only 39 per cent of Commercial Library users were resident in Manchester whilst the latter shows 67 per cent with work location in the City.

Telephone inquirers have always been the most anonymous section of the public and the decision to include them in the study was most welcome, particularly as there is so little published material available on this kind of information service.

How far the numbers using the Library on the days of the study are typical can be gauged by the annual figures of library use for 1972/3:

Personal visits: 225,000 (estimated)
Telephone calls for information: 20,228 (about one call in five includes more than one inquiry)
Telex messages: 2,105
Photocopies: 24,247.

From sampling, it is estimated that, apart from telephone inquiries, there are about 250 references to the staff a day, of which one hundred are for factual information and the rest for location of material in the Library and routine matters (the 16 per cent of readers in the study who admit to referring to the staff would seem a lower proportion than is our experience).

The full study includes twenty-four tables with explanatory comments and each could be further interpreted from 'the inside'. Some results are not surprising and fit in with observable trends. For example, taking Table 1, manufacturing industry (14 per cent of visitors) is rapidly declining in Manchester and being replaced by service trades and professions (61 per cent of visitors) whilst new industrial estates are opened further out (manufacturing industries, 42 per cent of telephone inquiries). More telephone inquiries come from the area within twenty miles of Manchester (52 per cent) than from the City itself (41 per cent). Other results are different from what one would suppose. In Table 3, the porportion of import/export information (8 per cent) is unexpectedly low, even taking into account the fact that this type of information can appear under other headings such as companies, market information, maps and statistics. One explanation may be that the very large sums of money spent in recent years by the Government not only on its export services themselves but also on the advertising of these services is having an effect.

One of the most intriguing aspects of the study, however, concerns the 26 per cent of visitors and 17 per cent of telephone inquirers who either did not receive a satisfactory answer or received only a partial answer. Some light is thrown on this by the information collected from the general comments collected by the questionnaire. These fell into three sections: (1) particular publications giving problems; (2) areas of difficulty; (3) problems with the system—especially the concern that facts are up to date. There is, of course, a very large proportion of business information not publicly available or which no library can hope to provide. The familiar plea (this time to Aslib?): 'please set up Co. information files to save having to pay a personal visit to London' comes into the latter category. Again, economic considerations preclude the provision of certain financial services or, for example, the subscriptions to American wall-paper trade journals which were among the items requested. Complaints such as those about yearbooks and directories being out of date, either in their date of publication or their contents, and the incompleteness of the 2½ inch Land Utilization Survey may be levelled at the Library but are more appropriately directed elsewhere. Nevertheless, we are here entering on the delicate subject of staff communication with users. How was the man dealt with who could not get the up-to-date information he required on American companies? Was he shown Moody's *News Reports*? Was the person who requested an updated list of Stock Market prices at 5 April 1968 unfortunate enough to ask a member of the staff who knew little about Capital Gains Tax or the relevant Extel service? The rate of staff turnover means that at any one time some staff lack the requisite experience, training or professional expertise and this certainly accounts for a fair proportion of dissatisfied readers.

What of the future? There is no doubt that the demand for information on British and overseas companies has been steadily increasing for many years and it is no surprise that it was the subject of 32 per cent of personal visits and 51 per cent of telephone inquiries. Statistics (11 per cent and 9 per cent) and Market Information (24 per cent and 9 per cent) taken together represent another expanding field. The high proportion of respondents who consider there are no disadvantages of the telephone inquiry over the personal visit indicates an obvious development, particularly when this is combined with an efficient photocopying service by return and, no doubt, eventually by immediate visual transmission.

REFERENCES

1 SMYTH, A. L. *Commercial information: a guide to the Commercial Library*. 3rd ed. Manchester: The Manchester Public Libraries, 1969.

2 SKELTON, BARBARA. *Design of information systems in the social sciences. Working paper no. 1: Comparison of results of science user studies with 'Investigation into information requirements of the social sciences'*. Bath University Library, July 1971.

A bibliometric survey of primary and secondary information science literature

P. Dansey

Information Scientist, INSPEC

A statistical analysis is made of the professional literature of librarians and information scientists in an attempt to uncover the patterns of information flow and to evaluate the abstracting services provided for information workers. Citation analysis of some English language information science journals throws light on the principal sources used by British and American information scientists and the linguistic and national biases in the citations given. The growth of the subject matter published in the field of information science is displayed. Five abstracting services are evaluated. Their scope in terms of the language, country of origin, subject matter and format of the material selected and abstracted is determined. Coverage is assessed in comparison with three bibliographies in this subject area. Currency is determined from NRLSI acquisition dates. Key journals are found from productivity analysis of the abstracted journals. Conclusions are drawn as to the adequacy of the present services and suggestions made for possible improvements.

Introduction

Bibliometrics, a term coined to describe 'the application of mathematics and statistical methods to books and other media of communication',[1] can be used to measure information transfer processes within a discipline. Its application to information science is opportune in view of recent moves towards better bibliographical control of the literature.[2]

Growth

Despite the information explosion in other disciplines, the growth of information science literature has been relatively modest over the last ten years. This is shown by the annual number of abstracts published by the leading abstracting services (Figure 1). Around six thousand articles are published annually. This is too many to be read by any individual irrespective of language barriers. Surveys show that the average information scientist reads a few leading journals and relies upon abstract journals and reviews to provide current awareness and to give a general overview of the subject.[3,4]

Citation analysis

One way of gauging information flow is by citation analysis. Table 1 shows the sources of citations of articles published in 1971 in five leading English language information science journals. They are the journals read most frequently by British information scientists.[3,4] A few journals provide most of the citations. They are: *Journal of the American Society for Information Science* (106 citations), which has a large proportion of self citations besides being high on most lists;

Journal of Documentation (59); *Aslib Proceedings* (34); and *Information Storage and Retrieval* (23). *Nature* and *Science* are also frequently cited. There is a remarkable number of references to non-periodical literature such as reports and books. This indicates that information science is nearer in character to the social sciences and the humanities than to the natural sciences. It is what Price[5] calls a 'soft science', having on average less than ten citations per article. The citation of reports may also indicate invisible colleges, with circulation of reports amongst fellow researchers.

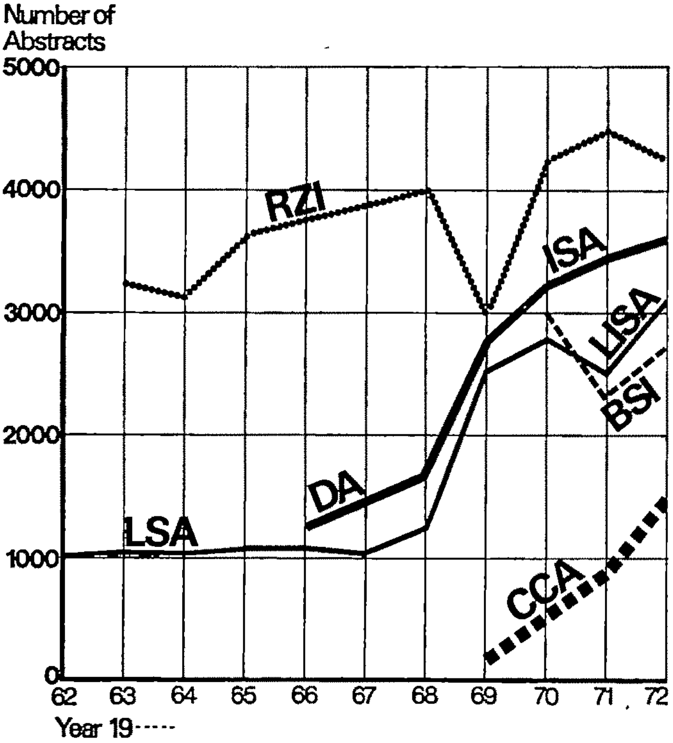


FIG. 1: *Annual number of abstracts published by leading abstracting services*

Abstract journals

Turning to secondary sources in information science literature we find four main abstracting services; *Bulletin Signaletique 101 Information Scientifique et Technique* (*BSI*), *Referativnyi Zhurnal Informatika* (RZI), *Library and Information Science Abstracts* (*LISA*), and *Information Science Abstracts* (*ISA*). In addition there are various indexing services such as *Library Literature* and bibliographic compilations published as parts of primary journals, for example *Nachrichten für Dokumentation*. Although previous surveys [6-9] of secondary services have included the latter, it was decided to concentrate upon evaluating what Coblans[10] has called the 'Big four', and in addition to compare them with the section on information science in *Computers and Control Abstracts* (CCA). RZI was formerly published as *Nauchnaya i Teknicheskaya Informatsiya* and is also now published as an English translation *Abstract Journal Informatics*. It includes, on average, four thousand abstracts per year. *ISA*, formerly *Documentation Abstracts*, publishes around three thousand abstracts annually. *LISA* was started in 1969, replacing *Library Science Abstracts* (*LSA*). It has a much larger coverage of information science literature than *LSA* and publishes over twice as many abstracts annually. Several articles have described its formation

TABLE 1: *Titles most frequently cited in articles in five leading English language information science journals in 1971*

Aslib Proceedings 149 citations from 59 titles (+204 reports etc.)		
J. Doc.	28	and 5 titles cited 3 times
Aslib Proc	18	11 titles cited twice
J. Am. Soc. Inf. Sci.	17	37 titles cited once
Bull. Med. Libr., Ass.	6	
Libr. Ass. Rec.	6	
The Information Scientist 17 citations from 9 titles (+17 reports etc.)		
Inf. Stor. Retr.	4	and 6 titles cited once
J. Am. Soc. Inf. Sci.	4	
Aslib Proc.	3	
Information Storage and Retrieval 81 citations from 36 titles (+93 reports etc.)		
J. Doc.	10	and 5 titles cited 3 times
J. Am. Soc. Inf. Sci.	10	5 titles cited twice
Inf. Stor. Retr.	7	24 titles cited once
Science	5	
Journal of Documentation 35 citations from 40 titles (+60 reports etc.)		
J. Doc.	15	and 3 titles cited 4 times
J. Am. Soc. Inf. Sci.	14	2 titles cited 3 times
Commun. ACM	13	5 titles cited twice
Datamation	12	21 titles cited once
Science	10	
Nature	7	
Inf. Stor. Retr.	5	
NRCD Bull.	5	
Rev. Doc.	5	
Journal of the American Society for Information Science 203 citations from 75 titles (+234 reports etc.)		
J. Am. Soc. Inf. Sci.	61	and 4 titles cited 4 times
J. Chem. Doc.	9	3 titles cited 3 times
Science	9	16 titles cited twice
Aslib Proc.	6	46 titles cited once
J. Doc.	6	
J. ACM	6	

and discussed its contents.[11–17] *BSI* was started in 1970 and it publishes around 2,500 abstracts annually. It has an English index. *CCA*, an INSPEC publication, has included a section on information science since 1969 and now includes around 1,500 abstracts per year on this subject.

Scope

1971 was taken as the base year for the survey of abstracting services. The abstract journals were compared in their scope by considering the type of literature which they abstracted. The source of each abstract published in 1971 in each abstract journal was noted and the journals contributing abstracts to each respective service were ranked in descending order of productivity (Tables 2, 3, 4, 5 and 6).

TABLE 2: *Library and Information Science Abstracts*
2192 abstracts from 221 journals (+301 reports etc.)

Nauchno-Tekhnicheskaya Informatsiya	84
Library Journal	81
Australian Library Journal	63
American Libraries	47
Aslib Proceedings	43
International Library Review	42
Library Association Record	42
Special Libraries	41
Zentralblatt fur Bibliothekswesen	40
Libri	39
Zeitschrift fur Bibliothekswesen und Bibliographie	38
Journal of Chemical Documentation	36
Journal of the American Society for Information Science	36
Bulletin of the Medical Library Association	35
Canadian Library Journal	35
Library Trends	35
Wilson Library Bulletin	34
Library Resources and Technical Services	33
Unesco Bulletin for Libraries	33
New Library World (incl. *Library World*)	30
New Zealand Libraries	29
Bogens Verden	27
Kirjastolehti	27
SLA News	27
Dokumentesyon Kenkyu	26
Assistant Librarian	24
Informatik	24
Bibliotekar (*USSR*)	22
College and Research Libraries	22
Ctenar	22
Bibliothekar	21
Probleme de Informare si Documentare	21
Nachrichten fur Documentation	20

and 5 Journals with 19 citations each
1 ,, ,, 18 ,, ,,
4 ,, ,, 17 ,, ,,
4 ,, ,, 16 ,, ,,
3 ,, ,, 15 ,, ,,
3 ,, ,, 14 ,, ,,
7 ,, ,, 13 ,, ,,
2 ,, ,, 12 ,, ,,
4 ,, ,, 11 ,, ,,
5 ,, ,, 10 ,, ,,
6 ,, ,, 9 ,, ,,
5 ,, ,, 8 ,, ,,
6 ,, ,, 7 ,, ,,
10 ,, ,, 6 ,, ,,
16 ,, ,, 5 ,, ,,
12 ,, ,, 4 ,, ,,
9 ,, ,, 3 ,, ,,
19 ,, ,, 2 ,, ,,
58 ,, ,, 1 ,, ,,

Table 2 shows that *LISA* draws many of its abstracts from journals in the field of librarianship with a smaller contribution from information science and documentation journals. It covers the primary journal literature well but is poor in its coverage of report, conference and other non-serial literature. *ISA* concentrates mainly on information science literature. It also abstracts from some library journals and journals specializing in micrographics, computer

TABLE 3: *Information Science Abstracts*
399 Journals with 1839 citations (+1470 reports)

Nauchno-Tekhnicheskaya Informatsiya	218
Journal of Chemical Documentation	83
Special Libraries	56
Journal of the American Society for Information Science	47
Library Trends	38
Journal of Documentation	33
Nachrichten für Dokumentation	33
College and Research Libraries	31
Information Storage and Retrieval	27
Library Resources and Technical Services	27
Journal of Micrographics	24
Library Journal	23
Nauchnye i Technicheskie Biblioteki	23
Dokumentation Kenkyu	23
Informatik	23
Aslib Proceedings	22
Actualne Problemy Informacji i Documentateji	20
Datamation	20
Unesco Bulletin for Libraries	19
Voprosy Izobretatel'stva	19

NRCD Bulletin	18
Libri	18
IMC Journal	17
Indexer	17
Methods of Information in Medicine	16
Science	15
American Libraries	15
and 4 Journals with 14 citations each	
3 ,, ,, 13 ,, ,,	
5 ,, ,, 12 ,, ,,	
2 ,, ,, 11 ,, ,,	
3 ,, ,, 10 ,, ,,	
2 ,, ,, 9 ,, ,,	
8 ,, ,, 8 ,, ,,	
7 ,, ,, 7 ,, ,,	
4 ,, ,, 6 ,, ,,	
10 ,, ,, 5 ,, ,,	
15 ,, ,, 4 ,, ,,	
31 ,, ,, 3 ,, ,,	
53 ,, ,, 2 ,, ,,	
223 ,, ,, 1 ,, ,,	

TABLE 4: *Referativnyi Zhurnal Informatika*
2958 abstracts from 505 journals (+1610 reports etc.)

Nauchno-Tekhnicheskaya Informatsiya	225
Nauchnye i Technicheskie Biblioteki	97
Informatik	60
Burotechnik + Organization	59
Journal of Chemical Documentation	48
Journal of the American Society for Information Science	47
Burotechnik + Automation	40
Ceskoslovenka Informatika (incl. *Met. a Tech. Inf.*)	39
Aktualne Problemy Informacji i Documentateji	38
Nachrichten für Dokumentation	38
Sovetskaya Bibliografiya	37
Standarty i Kachestvo	37
Reprographie	35
Zentralblatt für Bibliothekswesen	35
BIT (BDR)	33
Tudomanyos es Muszaki Tajekoztatas	33
Voprosy Izobretatel'stva	32
Das Rationelle Buro	31
Unesco Bulletin for Libraries	31
Aslib Proceedings	30
Probleme de Informare si Documentare	29
Technicka Knihovna	28
Voprosy Filosofi	27
Bibliotekarz	26
Bibliotheku Darbas	26

Burghagens Zeitschrift fur Burotechnik und Information	26
ADL-Nachrichten	25
Journal of Library Automation	24
Special Libraries	23
IBM Nachrichten	22
ANRT Information et Documentation	21
Information Storage and Retrieval	21
and 2 Journals with 20 citations each	
2 ,, ,, 19 ,, ,,	
4 ,, ,, 18 ,, ,,	
3 ,, ,, 17 ,, ,,	
3 ,, ,, 16 ,, ,,	
5 ,, ,, 15 ,, ,,	
8 ,, ,, 14 ,, ,,	
3 ,, ,, 13 ,, ,,	
3 ,, ,, 12 ,, ,,	
7 ,, ,, 11 ,, ,,	
9 ,, ,, 10 ,, ,,	
9 ,, ,, 9 ,, ,,	
7 ,, ,, 8 ,, ,,	
5 ,, ,, 7 ,, ,,	
20 ,, ,, 6 ,, ,,	
16 ,, ,, 5 ,, ,,	
30 ,, ,, 4 ,, ,,	
34 ,, ,, 3 ,, ,,	
65 ,, ,, 2 ,, ,,	
238 ,, ,, 1 ,, ,,	

TABLE 5: *Bulletin Signaletique 101 Information Scientifique et Technique*
241 Journals with 1700 citations (+656 reports etc.)

Nauchno-Tekhnicheskaya Informatsiya	185	*Documentaliste*	20
Revista dell'Informazione	59	*International Library Review*	19
Journal of the American Society for Information Science	50	*Library Trends*	19
Informatik	48	*Data Systems*	18
Special Libraries	46	*Journal of Documentation*	18
Journal of Chemical Documentation	41	*Information Storage and Retrieval*	17
Aslib Proceedings	39	*Dokumentation, Fachbibliothek, Werksbucherei*	16
Bulletin of the Medical Library Association	36	*Law and Computer Technology*	16
Unesco Bulletin for Libraries	33	*Informatique*	15
Zentralblatt fur Bibliothekswesen	33	*Journal of Data Processing and Office Machinery (Neue Tecknik im Buro)*	15
Journal of Micrographics	32	*Library Resources and Technical Services*	15
ANRT Information et Documentation	30	and 1 journal with 14 citations each	
Nachrichten fur Documentation	30	3 ,, ,, 13 ,, ,,	
Library Journal	29	2 ,, ,, 12 ,, ,,	
Polygraph	29	5 ,, ,, 11 ,, ,,	
Bibliotekar (*USSR*)	27	4 ,, ,, 10 ,, ,,	
Aktualne Problemy Informacji i Documentateji	26	2 ,, ,, 9 ,, ,,	
Computers and the Humanities	26	10 ,, ,, 8 ,, ,,	
Information et Gestion	24	1 ,, ,, 7 ,, ,,	
Annals of Library Science and Documentation	23	3 ,, ,, 6 ,, ,,	
Computers and Automation	23	6 ,, ,, 5 ,, ,,	
INSPEL	23	14 ,, ,, 4 ,, ,,	
Bulletin of CIMBA	21	14 ,, ,, 3 ,, ,,	
		35 ,, ,, 2 ,, ,,	
		106 ,, ,, 1 ,, ,,	

TABLE 6: *Computer and Control Abstracts, Chapter 85*
585 abstracts from 130 journals (+285 reports etc.)

Nauchno-Tekhnicheskaya Informatsiya	143	*Informatik*	9
Journal of the American Society for Information Science	51	*International Library Review*	9
Journal of Chemical Documentation	33	*Nachrichten für Dokumentation*	9
Journal of Library Automation	24	*Datamation*	7
Aslib Proceedings	23	*Program*	7
Information Storage and Retrieval	22	*IEEE Transactions on Engineering Writing and Speech*	6
Journal of Documentation	22	*Aktualne Problemy Informacji i Dokumentacji*	5
IBM Technical Disclosure Bulletin	16	*Journal of Micrographics*	5
Bulletin of the Operational Research Society of America	14	and 3 journals with 4 citations each	
Computers and Biomedical Research	12	6 ,, ,, 3 ,, ,,	
The Information Scientist	10	18 ,, ,, 2 ,, ,,	
Unesco Bulletin for Libraries	10	82 ,, ,, 1 ,, ,,	

science and information science applications in medicine, law and other subjects. It covers report literature well (40 per cent of the abstracts were from non-serial literature in 1971). Russian works are covered by the copying of abstracts from *Referativnyi Zhurnal.*

RZI contains the largest number of abstracts (over 4,500 in 1971) and has the widest scatter of journal articles. Over five hundred journals were cited in 1971 but of these 60 per cent provided only one or two abstracts. The literature covered included office organization and methods, administrative data processing, reprography and other fringe subjects, as well as the main information science and documentation journals. Its coverage of Soviet, East European and German literature is second to none and it also includes a considerable amount of English language and Japanese material. It cites a large amount of report and other non-serial literature, especially from Eastern Europe and Russia.

BSI falls somewhere between *RZI* and *ISA* in its subject scope. It takes abstracts from information science, special library, reprography and computer science journals. It includes a fair amount of report and other non-serial literature (25 per cent) and draws its material from a wide range of languages and countries.

CCA made only a small contribution to the abstracting of information science literature in 1971. The main journals cited were information science or computer science oriented. 23 per cent of the total citations were to report, conference and other non-serial literature. Of the 130 journal titles cited, one hundred contributed only one of two abstracts.

The total number of titles cited by the four main services (*LISA*, *ISA*, *BSI* and *RZI*) in 1971 was 987. Of these 747 (75 per cent) were cited by only one service, 143 by two services, 58 by three services, and forty by all four. These forty core journals are listed in Table 7. To them can be added a further eighteen high productivity journals which were cited by three out of the four services (Table 8). Although the core journals in Table 8 are only a small proportion of the total number of titles cited, they contributed 30–50 per cent of the journal abstracts to each service. This shows that the overlap is greater than is apparent from considering journal titles alone. There is some variation between the services in their selection of articles from these core journals. Some such as *LISA* select more from the librarianship journals and some of the others select more from the computer science journals. There is also a bias in selection towards journals from the same country or in the same language as the abstracting service.

Coverage

The coverage of abstracts journals is assessed using the bibliography test[18] which has been applied previously by Gilchrist[8] to secondary services in information science. The technique involves searching the author indexes of the abstract journals for items in a bibliography. In the present survey, three bibliographies were selected from articles published in the *Annual review of information science and technology, vol. 6.*[19] Bibliographies taken from this book are suitable because they provide 50–100 citations to recent literature and so provide a fair test of the coverage of the services such as *BSI* which entered this field only recently. The bibliographies are in the main compiled by the editorial staff of the *Annual Review*[20] with some additions made by the authors of the articles. There is a bias towards American literature and in particular to report literature[21] and therefore it cannot be said that the bibliographies are fully representative of the world literature in information science. But, despite these inadequacies the bibliographies present a reasonably objective means for testing the coverage of the abstract services. The number of citations taken from the bibliographies was less than the total number of references, because anonymous, unpublished and pre-1968 material was excluded.

TABLE 7: *40 Journals abstracted by the four main services*

	Citations		Citations
Nauchno-Tekhnicheskaya Informatsiya	712	*Program*	48
Journal of Chemical Documentation	208	*Bulletin des Bibliothèques de France*	41
Journal of the American Society for Information Science	180	*Library Quarterly*	38
Special Libraries	166	*Studii si Cercet de Documentare*	38
Informatik	155	*Dokumentation, Fachbibliothek, Werksbucherei*	38
Library Journal	137	*Computers and the Humanities*	35
Aslib Proceedings	125	*Inspel*	36
Nachrichten für Dokumentation	121	*The Information Scientist*	35
Zentralblatt für Bibliothekswesen	120	*Journal of Librarianship*	34
Unesco Bulletin for Libraries	116	*Documentaliste*	33
Aktualne Problemy Informacji i Documentacji	105	*Informatique et Gestion*	33
Journal of Documentation	84	*Tidskrift für Dokumentation*	33
Information Storage and Retrieval	81	*Biblioteki SSSR*	30
Libri	76	*Communications of the ACM*	30
Bibliotekar'	69	*Indexer*	29
College and Research Libraries	66	*Science*	25
Journal of Library Automation	65	*IEEE Transactions on Engineering Writing and Speech*	21
Annals of Library Science and Documentation	62	*Nature*	20
Zeitschrift fur Bibliothekswesen und Bibliographie	56	*Microdoc*	19
		Elektronische Datenverarbeitung	7
		Information and Control	4

TABLE 8: *Journals frequently cited by three out of four services*

	Citations		Citations
Library Trends	92	*Tudomanyos es Muszaki Tajekoztatas*	64
Bulletin of the Medical Library Association	85	*Dokumentesyon Kenkyu*	58
Revista dell'Informatzione	83	*Journal of Micrographics*	57
Library Resources and Technical Services	75	*ANRT Information et Documentation*	55
International Library Review	74	*Reprographie*	51
Ceskoslovenska Informatika	69	*Wilson Library Bulletin*	51
American Libraries	67	*Bibliotekarz*	45
Library Association Record	64	*Canadian Library Journal*	45
		Bulletin of CIMBA	35
		Computers and Automation	29

The articles from which the bibliographies were taken were *Document retrieval and dissemination* by J. J. Magnino Jr. (82 out of 101 citations selected);

Document description and representation by B. C. Vickery (45 out of 50 citations selected); and *Design and evaluation of information services* by C. W. Cleverdon (67 out of 81 citations selected).

The comparative coverage of the five abstract journals is shown in Figure 2. It can be seen that *ISA* is the most consistent in its coverage with over 50 per cent in each case. *CCA* does well in its coverage of the first bibliography because of the computer science bias of the citations. *LISA* does well in its coverage of the latter two bibliographies. *BSI* has a fair overall coverage and *RZI* has rather a poor performance, probably because of the English language

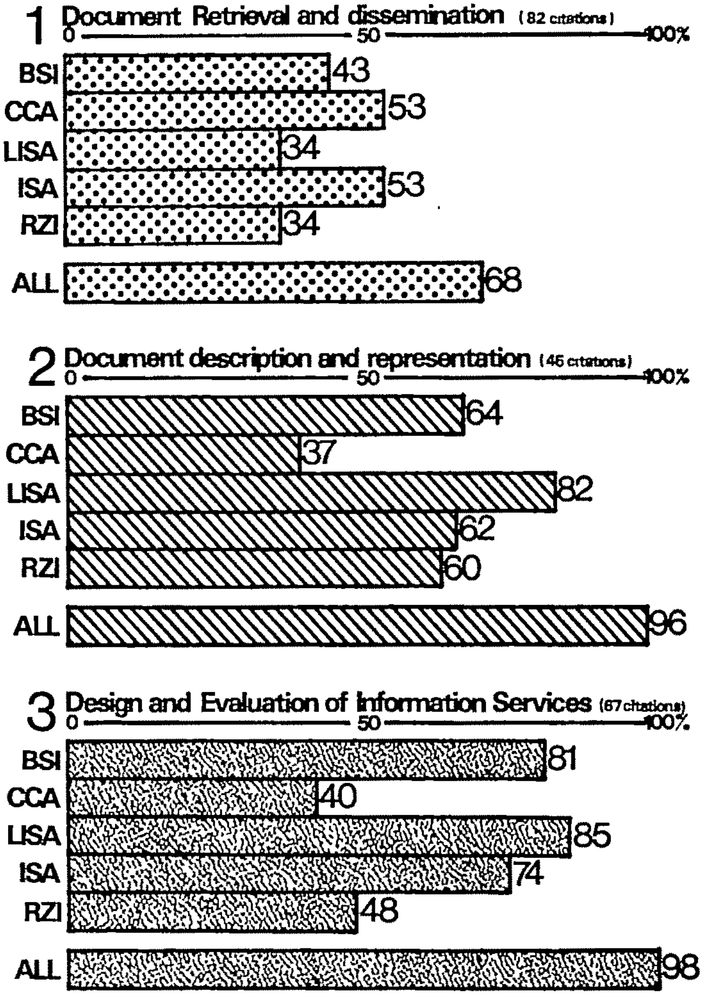


FIG. 2: *Abstract journal coverage of three bibliographies from 'The annual review of information science and technology, volume 6'*

bias of the citations. The coverage of the bibliographies by all the abstract journals combined is good and is excellent in the case of the last two bibliographies.

Currency

The currency of the abstracts journals was assessed using acquisition dates at the National Reference Library for Science and Invention. The acquisition date of a primary journal article and the acquisition date of its abstract in the abstract journal were compared. The difference between the two dates gave a measure of the abstract journal currency or time lag. The results are shown in Table 9. *CCA* and *LISA* have the best currency with time lags averaging between two to three months. *ISA* is very poor in its currency with an overall time delay of over a year and in one case a delay time of two and a half years. *RZI* and *BSI* have fair currencies of four to seven months.

Conclusions

The situation in the bibliographical control of library and information science literature has been compared to that of 'the shoemaker's children', i.e. information workers are concerned with the improvement of information services in other disciplines to the neglect of their own.[22,23] However, there has been some improvement in the services over the last five years. There are now four main services in the field, each of which has its good and bad points. *LISA* provides a good all-round service. It has a comprehensive coverage of the primary journal literature and has a good currency. Its drawbacks are its relative neglect of fringe material such as computer science, reprography and management science, and its poor coverage of reports and other non-serial literature. *ISA* is good in its coverage of reports (especially American material) and fringe subjects, but it has a very poor currency. In fact it is more useful for retrospective searching than for current awareness. *BSI* has a good all-round performance and it covers the fringe literature and the applications of information science well through its being part of a larger abstracting organization. *RZI* also has this advantage. Its coverage of Russian and East European material is the best of all the services and it has a fair currency. *CCA* has the best currency of all the services and its coverage of the literature is fair and improving. It also has the advantage of being part of a larger organization and can cover the application of data processing methods to information retrieval particularly well.

There have been several meetings in the past to discuss co-operation between abstracting services and measures for the bibliographic control of the literature,[2,11,22,23] but very little of substance has followed. There are two problems in the bibliographical control of the literature. One is the wide scatter of journal articles which arises from the service function of information science and its lack of definition, especially the borderline with computer science and librarianship. The second is to what extent the report literature is important. It is certainly cited to a considerable extent and it is not always subsequently published in a journal.

Perhaps some form of co-operation between the abstracting services in the collection and abstracting of reports would be valuable. It is hoped that the

TABLE 9· *Currency of abstract journals (using NRLSI accession dates)*

	No. of Abstracts					Mean Delay (days)					Max. Delay (days)					Min. Delay (days)				
	ISA	*LISA*	*CCA*	*RZI*	*BSI*	*ISA*	*LISA*	*CCA*	*RZI*	*BSI*	*ISA*	*LISA*	*CCA*	*RZI*	*BSI*	*ISA*	*LISA*	*CCA*	*RZI*	*BSI*
Aslib Proceedings	15	26	11	7	16	614	69	98	229	152	730	131	114	244	175	582	24	79	206	131
The Information Scientist	3	7	3	5	2	605	85	71	222	182	628	120	91	224	182	559	79	62	221	182
Inform Storage Retrieval	16	9	18	12	12	576	112	78	229	141	655	119	87	248	167	552	98	64	210	101
Journal of Chem. Doc.	44	27	26	16	14	247	101	103	243	141	687	111	130	260	141	180	95	99	211	141
Journal of Documentation	21	18	14	8	4	423	57	75	221	185	643	73	91	227	189	325	41	57	189	157
Nauk Tekh. Inf. Series I	46	20	62	56	35	340	143	87	180	156	708	166	128	220	181	238	112	69	173	122
Nauk Tekh. Inf. Series II	46	15	48	47	17	379	137	80	173	135	650	161	106	232	189	240	103	66	161	146
All Journals	191	122	182	151	100	382	99	86	194	124	730	166	130	260	189	180	24	57	161	101

present paper may be of assistance in establishing the coverage of present services and identifying the key journals.

REFERENCES

1 PRITCHARD, A. Statistical bibliography or bibliometrics? *Journal of Documentation*, **25**, 4, 1969, p. 348–9.

2 Unesco Symposium of Editors of Documentation, Library and Archives Journals, Unesco, Paris, 16th–17th May 1972.

3 STERN, B. T. Report on the institute questionnaire. *The Information Scientist*, **5**, 4, 1971, p. 161–4.

4 DANSEY, P. Do information scientists read about information science. *The Information Scientist*, **6**, 3, 1972, p. 105–7.

5 SOLLA PRICE, D. J. DE. Citation measures of hard science, soft science, technology and non-science. *In: Communications among scientists and engineers*, C. E. Nelson and D. K. Pollock (eds), p. 3–22. D. C. Heath, 1970.

6 BUNTROCK, H. Dokumentation der Dokumentation II. *Nachrichten fur Dokumentation*, **15**, 3, 1964, p. 145–7.

7 WHATLEY, H. A. Library science and documentation indexing and abstracting services. *Unesco Bulletin for Libraries*, **19**, 5, 1965, p. 226–31.

8 GILCHRIST, A. Documentation of documentation. A survey of leading abstracts services in documentation and an identification of key journals. *Aslib Proceedings*, **18**, 3, 1966, p. 57–86.

9 NOVAKOVA, H. The analysis of secondary sources in informatics. Prague: Charles University Department of Librarianship and Scientific Information, 1969. Report No. L-109-6/3.

10 COBLANS, H. The literature of librarianship and documentation: the periodicals and their bibliographical control. *Journal of Documentation*, **28**, 1, 1972, p. 56–66.

11 EDWARDS, T. *LISA: Library and Information Science Abstracts*. A new service for librarians and documentalists. *Library Association Record*, **71**, 2, 1969, p. 41–3.

12 GILCHRIST, A. *Library and Information Science Abstracts*: a brief progress report. *Aslib Proceedings*, **21**, 8, 1969, p. 325–7.

13 WHATLEY, H. A. Abstracting the literature of library science. (1) On using *Library and Information Science Abstracts* 1969. *Library Association Record*, **73**, 3, 1971, p. 45–6.

14 EDWARDS, T. (2) The case for the present arrangement. *ibid* p. 46–7.

15 GILCHRIST, A. *and* PRESANIS, A. *Library and Information Science Abstracts*: the first two years. *Aslib Proceedings*, **23**, 5, 1971, p. 251–6.

16 EDWARDS, T. *LISA* and the comprehensive control of library and information science literature. *International Library Review*, **4**, 1972, p. 67–70.

17 HEINZKILL, R. An American looks at *LISA*. *International Library Review*, **3**, 1971, p. 251–6.

18 MARTYN, J. *and* SLATER, M. Tests on abstracts journals. *Journal of Documentation*, **20**, 4, 1964, p. 212–35.

19 CUADRA, C. A. *ed. Annual review of information science and technology*. Vol. 6. Chicago: Encyclopaedia Britannica, 1971.

20 CAUDRA, C. A. *The annual review of information science and technology*: its aims and impact. *Drexel Library Quarterly*, **8**, 1, 1972, p. 17–28.

21 SARACEVIC, T. Book review: 'Five years, five volumes and 2345 pages of the *Annual Review of Information Science and Technology*. *Information Storage and Retrieval*, **7**, 3, 1971, p. 127–39.

22 The Shoemaker's Children: *Library Journal*, **93**, 11, 1968, p. 2215–17.

23 WHATLEY, H. A. The bibliographical control of library science literature. *Library World*, 70, p. 19–21.

Translations in the UK

Compiled by Aslib Information Department

A. SERVICES AVAILABLE

(1) Collections of translations into English

(a) *National Lending Library.* Since 1966 translations into English from all languages have been collected and there is an extensive collection of pre-1966 material, mainly from East European, Russian and Oriental languages. The total number of translations now held is over 200,000. Additions per annum: 18,000 from US sources; 1000 from NLL's own translation service; 5,000 from other British sources. In addition 290 cover-to-cover translated journals are taken, 14 of which are produced with financial support from the NLL.

(b) *National Reference Library.* Approximately 180 cover-to-cover translated journals are taken and there is a card index of over 30,000 translations held by the library. Published translations are normally filed alongside the originals. In cases where translations of single articles only are held, the original article in the foreign journal is marked to refer readers to the location of the translation.

(2) Indexes and Bibliographical Tools

(a) *Commonwealth Index of Unpublished Translations.* The *Index* is maintained by Aslib. It was set up in 1951 and takes the form of a card index which can be easily modified and expanded. There is no published edition. The *Index* is in three sections: journal articles; patents and standards; books, theses and reports.

The *Index* contains over 450,000 entries, 25 per cent of which come from sources who do not 'publish' translations and in most cases do not wish it to be generally known that the topic of the translation is of interest to them. The *Index* is purely a location index and includes all translations held by NLL as well as those listed in the *US Translations Register Index*. Notifications of completed translations average 10,000 per annum. Over 21,000 requests for locations of translations are received each year.

(b) *Translations Register Index.* In 1947 the Office of Technical Services (OTS) was formed to co-ordinate translations of German and Japanese material. In 1953, the Scientific Translation Center of the Library of Congress, under the sponsorship of the National Science Foundation, began collection of Russian translations. From 1953–56, this centre published *Bibliography of Translations From Russian Scientific and Technical Literature.* At the same time, the Special Libraries Association Translations Pool at the John Crerar Library began collecting translations from other languages. In 1959, a reciprocal arrangement was made between North America, Great Britain and continental Europe, co-ordinated by OTS. Between 1959–67, *Technical Translations* was produced by the Clearinghouse for Federal Scientific and Technical Information (CFSTI) the successor to OTS. This was semi-monthly and included all US government translations and many others produced in Europe and US. In 1967 CFSTI became responsible for government translations while the Special Libraries Association Translation Pool, now known as the National Translation Centre or NTC, became responsible for all others and the comprehensive *Index*. This index is the *Translations Register Index* which has been published semi-monthly since 1967. The *Index* includes all accessions of the NTC as well as government translations originally listed in *US Government Research and Development Reports* (since 1972 called *Government Reports Announcements*) and those translations originating in the UK deposited with the NLL. (Since January 1973 the *Index* is monthly.) Earlier translations are dealt with in the NTC's 1969 publication *Consolidated Index of Translations into English* (CITE). This includes publications originally listed in *Technical Translations*, *Bibliography of Translations from Russian Scientific and Technical Literature*, *SLA List of Translations 1953–4*, and *SLA Translations Monthly 1955–1*.

(c) *Index Translationum*. Published by UNESCO since 1949. This is an annual bibliography covering books only; the most recent volume, published in 1972, lists over 40,000 books translated in 1970 in 73 countries.

(d) *World Index of Scientific Translations*. Published by European Translations Centre in 1967. Monthly, with quarterly and annual cumulations Covers only translations from 'difficult' languages into ten European languages.

(e) *Transatom Bulletin*. A monthly list of translations in the nuclear energy field, published by the Commission of the European Communities with co-operation of other national nuclear energy organizations.

(f) There are also a number of lists maintained by various specialist agencies including the following:

(i) Machine Tool Industry Research Association maintains a union list of translations on machine tools and other subjects held by a number of organizations.
(ii) The British Iron & Steel Industry Translation Service (BISITS) is a consortium of steel firms contributing translations to a central pool. A weekly list of completed translations, a fortnightly list of translations in preparation, and an annual classified list are published. These lists are available to enquirers. The Service is also responsible for publishing the cover-to-cover journal, *Steel in USSR*.

(g) NLL publishes:

(i) *Books Received from USSR and Translated Books*.
(ii) *Announcement Bulletin*.

These are all current awareness publications having no published indexes and therefore not particularly suitable as finding tools.

(h) NRL publishes several *Aids to Readers*, including *Holdings of Translated Journals; Translations: a general guide to their availability; Linguistic Help and Translations Series.*

(i) *Bibliographical Tools*

GREMLING, R. C.
English language equivalent editions of foreign language serials. New Jersey Literature Service Associates, 1966. (2nd ed.) 138p. $5.00.

HIMMELSBACH, C. J. *and* BOYD, G. E.
A guide to Scientific and Technical journals in translation. New York: Special Libraries Association 1972 (2nd ed.) 50p.

LEE, A. C. *and* CHANG, D. C. D.
A bibliography of translations from mainland Chinese periodicals in chemistry, general science and technology. Washington, DC: National Academy of Sciences, 1968. 162p.

RANGRA, V. K.
Study of cover-to-cover English translations of Russian scientific and technical journals. *Annals of Library Science and Documentation,* 1968, 15, 1, p. 7–22.

B. TRANSLATORS

(1) Aslib Register of Specialist Translators

Aslib maintains a *Register of Specialist Translators*, which records the names of over 200 translators with both subject and linguistic qualifications. It is restricted to individuals who can provide references to their competence. Aslib makes no recommendation about fees, which are a matter for agreement between the employer and the translator, although each translator is asked to state his basic charges. Comments on the work are invited and recorded so that a constant check on competence is maintained. The use of the Register is limited to members of Aslib only.

(2) Institute of Linguists

The Index to Members of the Translators' Guild lists fellows and members of the Institute who are able to produce translations. The *Index* is classified by subject, language and geographical area. The Institute also publishes recommended rates for translating and interpreting.

(3) Other sources

Many regional reference libraries maintain lists of translators living in the locality. There is also a considerable number of translations agencies in the UK, although not all of these are able to deal with scientific or technical translations. There are a number of published lists of translators and translations agencies, but few of these are as up to date as one would wish.[1,2]

C. PROBLEMS WHICH ARISE IN LOCATING TRANSLATIONS

Most requests for translations are for recently published material. Because of delay between publication of the original and the appearance of the translation in the *Index* or other list, negative answers are more common than positive ones. To try to overcome this, all unsuccessful requests are recorded in the Aslib *Index* and other inquirers informed at the first request. Nevertheless some duplication still occurs.

It takes time to build up a translation programme to meet a demand and, meanwhile, the demand is likely to change. In 1959 translations from the Russian were most frequently requested, followed by German, French and Japanese. In 1972 the most requested language was German, followed by Russian, Japanese and French. The respective success rates in 1972 were 12 per cent, 18 per cent, 3 per cent and 5 per cent. Disregarding French which is not commonly translated for obvious reasons, it looks as if the main problem area is now Japanese.

Although the *Translations Register Index* lists most of the more readily available translations of the USA, UK and Europe, there are few *published* bibliographical tools listing less readily available translations. An alternative to full translation is the use of English language abstracts and the main problem here is general lack of awareness of suitable sources. The most comprehensive published guide to these is *Ulrich's International Periodicals Directory* which, for each journal listed, gives information on indexing and abstracting services which include the journal regularly. There are also a number of services published by the Japanese themselves, which provide abstracts in English of articles in Japanese. These Japanese publications are listed in *Ulrich* as well as in other lists of abstracting journals. Aslib's *Classified Directory of Japanese periodicals*,[3] which lists over 1500 Japanese titles, also indicates which journals provide summaries or abstracts in a European language (which is almost always English). Another alternative is the provision of verbal translation services, possibly using audio tape. A number of private organizations provide verbal services for their own users, but the only known public service is that provided by the NRSLI.

Many of the problems would be eased if there were greater co-operation between producers of translations. In spite of publicity given to the Aslib *Index* there are still a great many organizations which do not notify Aslib of their translations, or deposit with the NLL. One reason is that industry is often reluctant to let others know of their interest in a particular subject; another is that translations produced are often rough and unpolished products which organizations are unwilling to release pending further editing which, in most cases, is never done for lack of time.

REFERENCES

1 FINLAY, I. F. *Language services in industry.* London: Crosby Lockwood, 1973. 156p.
2 SYKES, J. B. *Technical translator's manual.* London, Aslib, 1971. 173p.
3 MASON, P. C. R., *comp. A classified directory of Japanese periodicals: engineering and industrial chemistry.* London: Aslib, 1972. 160p.

BRIEF REVIEWS

ANDERSON, I. G. *ed.* Current British Directories: a guide to the directories published in Great Britain, Ireland, the British Commonwealth and South Africa. 7th edition, 1973–74. Beckenham (Kent): CBD Research Ltd, 1973. 358 pp. £8.50. (ISBN 900246 12 X)

The presentation of information remains essentially the same in this edition as in the 6th edition. Local and regional directories are listed in Part 1, which includes a detailed place index. Part 2 constituting the principal section of the directory is an alphabetical listing of specialized directories containing details of general trade directories and publications covering particular industries, trades and professions; membership lists issued by association, who's whos and yearbooks. For the first time this section has an addendum containing entries received too late for inclusion in the main sequence. Part 3 presents a select list of the directories published in, or concerned with, the countries of the Commonwealth, South Africa and Pakistan. The remainder of the publication lists publishers issuing more than one directory with the addresses and key to their publications. The detailed subject index includes a number of cross references and grouped headings such as 'Trade marks and trade names' and 'Retailers'. It also presents an analysis of the principal contents, and indicates the geographical coverage, of the directories. The selective classified index included in the 6th edition is not included as it was felt its restricted coverage could be misleading.

The entry for each directory contains as far as possible the following information: title; publisher; date of first edition; frequency of issue and, given for the first time in this edition, the month of publication; date, price and pagination of the edition examined and description of the contents, coded with suitable abbreviations. About 500 new entries are listed in this edition.

Current British Directories has long since proved its worth to librarians and others concerned with extracting information contained in directories. This new edition will be welcomed, as is the information that preparation is already being made for publication of the 8th edition in 1975.

ANDERSON, I. G. *comp.* Current African Directories, incorporating 'African companies: a guide to sources of information': a guide to directories published in or relating to Africa, and to sources of information on business enterprises in Africa. Beckenham (Kent): CBD Research Ltd, 1972. 187 pp. £10; $30. (ISBN 900246 11 1)

Current African Directories is designed as a companion volume to *Current British Directories*, *Current European Directories*, and *European Companies: a guide to sources of information.* This new volume contains both an alphabetical listing of published directories about aspects of Africa in general and/or for named African countries, and a listing of sources of information on African companies and other forms of business enterprise.

The compilation of this book was completed in July 1972, after personal inspection of most of the directories listed in libraries in London and after correspondence with official bodies in the countries concerned.

The first sequence is of directories arranged alphabetically by title. Details given include publisher, date of first and current editions, frequency, and analysis of contents. Part Two begins with a subject index to directories covering Africa as a whole or large areas of the continent, and directories of Africanist institutions. Following this index African countries are listed alphabetically, and details in each entry provide, *inter alia*, a brief narrative account of sources of company information, including official sources; notes of publications listing new companies; names and addresses of major stock exchanges; and references to relevant sources described in Part One. These particulars are followed by a subject index to the directories of the country, which should be used in conjunction with the general index for Africa.

Another winner from the CBD stable.

ARCHITECTURAL PERIODICALS INDEX. Vol. 1, No. 1, August to December 1972. London: RIBA, 1973. 122 pp. £12 p.a. (RIBA members £8) (Cumulative edition only: £10; RIBA members £6.)

It is unnatural to expect any periodical publication to maintain a continuously uniform format in days when publishing techniques and production methods are rapidly changing. Libraries are not designed to hold long neat runs of journals, but to house the equipment necessary for rapid and efficient information retrieval. Hence, though the few diehards will regret the passing of those well-produced, easy to read tools, the *RIBA Library Bulletin* and its more important companion the *RIBA Annual Review of Periodical Articles*, most librarians and information officers in the field will welcome the more rapid, though physically inferior, publication which supersedes them: the *Architectural Periodicals Index.*

We had been warned in the last issue of the *Annual Review* that due to the 'considerable time lag between the publication of the original material which was indexed and the appearance of the index itself' the decision had been made to 'merge these two journals into one and to produce this new journal by photo-offset lithography which will cut the time-lag from several months to a few weeks'. The first two issues of the *Architectural Periodicals Index* have now been published and certainly they have fulfilled the promise of more rapid production: volume 1, number 2, covering material received in the RIBA library during January to March 1973, was issued in May 1973 and includes details of items from February 1973 issues of foreign journals. This is a very creditable achievement even at the expense of typographical clarity, and the publication of the *Book Accession List* as a physically separate insertion will mean that libraries will no longer have to retain the quarterly issues after the annual cumulation of the *Architectural Periodicals Index* appears.

There is another major change in the publication however which may not be as welcome. Presumably with the interests of speed of compilation paramount, entries in the index are now arranged alphabetically by subject under headings derived from the RIBA Periodicals Subject Index, instead of the UDC classified arrangement used formerly. The relative merits of both systems have long been debated and undoubtably some of the UDC groups used in the *RIBA Library Bulletin* were too general and hence unwieldy, especially when cumulated in the *Annual Review*. However, the very specialized headings of the new publication, combined with the scattering of related subjects throughout the alphabetical arrangement, will cause difficulty in more complex searches: one wonders about the reasons for this change and why there has been no editorial comment on a decision so important to intending users of the *Architectural Periodicals Index*.

SMITH J. ROLAND, *ed.* Guide to UKAEA documents. 5th edition. London: UKAEA, 1973. 48 pp. 30p. (SBN 8535 6025 0)

In the fifth edition of the *Guide* the opportunity has been taken to incorporate the changes in the UKAEA's publication programme which may result from the recent reorganization of the Authority's structure. In 1971 both the Radiochemical Centre and the Production Group became public companies outside the Authority and their current publications are no longer covered by the *Guide*: this still however includes information on Weapon Group documents, although the latter has now become part of the Ministry of Defence.

The *Guide* provides precise and detailed information on the publication, dissemination, availability and bibliographical control of the reports and other documents issued by the UKAEA; describes the current report numbering systems of the various establishments; and provides a detailed check list of report series no longer currently published.

It is, as in the case of earlier editions, an indispensable tool for those who need to know of and use UKAEA documents.

WHO'S WHO IN PERSONNEL ADMINISTRATION AND INDUSTRIAL RELATIONS. Epping (Essex): Gower Reference Publications, 1973. 518 pp. £8.50. (ISBN 0 7161 0132 7)

It is pleasing to see that fields other than science and technology are gradually being covered by the Who's Who type of publication. This one covers not only personnel managers in large companies but also those holding relevant positions in unions, management centres, consultancies, local and central governments etc. There are over 2,300 entries.

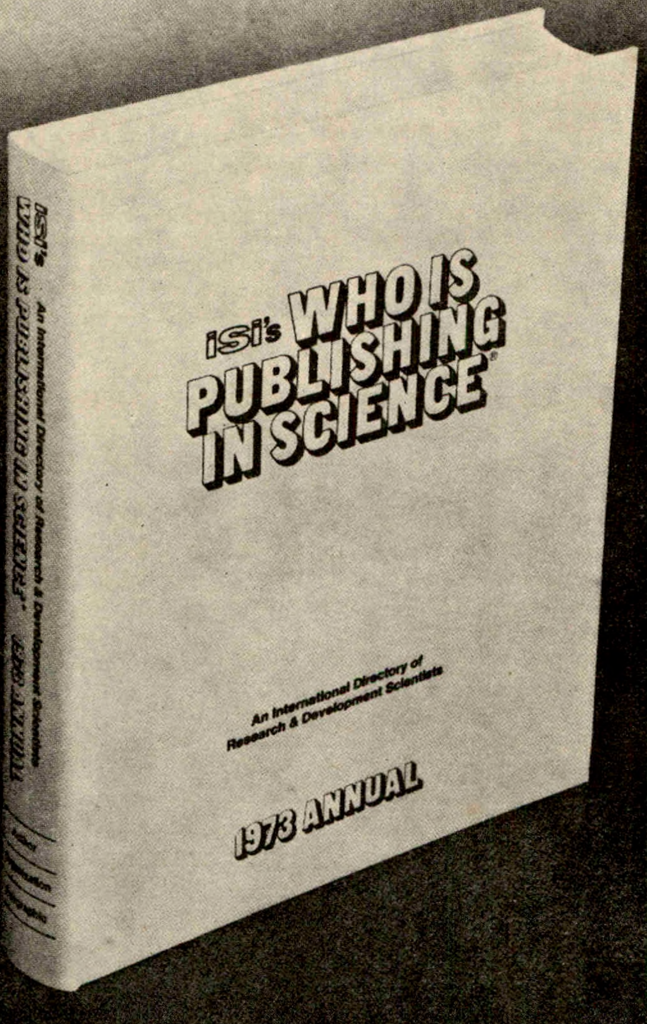
The first section of the book contains extended biographies of four of the leading figures in personnel; profiles of the Institute of Personnel Management, the Industrial Society and the TUC and brief details of forty relevant major institutions, societies and government departments. Section two contains the biographies in alphabetical order. Information given includes qualifications, present status, name of organization, type of business and the number of employees, career history, age, education, publications, company and home addresses and telephone numbers. There are two indexes: one lists, in alphabetical order, all firms identified as employers and the names of the individuals in these for whom biographies are included; and the other is an index of the individuals by field of activity.

AMERICAN SOCIETY FOR INFORMATION SCIENCE. Annual review of information science and technology (ARIST). Cumulative Index, Vols. 1–7, 1966–1972. Washington, D.C.: ASIS, 1972. 180 pp. $5. (ISBN 0 877 15207 1)

For the first time the Cumulative Index to ARIST appears as a separate volume covering the first seven years. It indexes the contents of ninety-one chapters in twenty-four major subject areas, including over ten thousand bibliographic references. Individual and corporate authors, subject headings and cross references are arranged in one alphabetical sequence. The 'Combined index', which appeared in previous volumes, has been expanded and standardized to produce an improved index.

This is indeed a unique key to a considerable part of the world's literature in our field.

Ever wish you had an international directory of scientific authors and organizations?


ISI's WHO IS PUBLISHING IN SCIENCE®
An International Directory of Research & Development Scientists
1973 ANNUAL
ISI's An International Directory of Research & Development Scientists
WHO IS PUBLISHING IN SCIENCE®
1973 ANNUAL

Here it is, brand new for 1973.

Was it Schmidt or Schmitt who published that article in *Science* last year? Is Saitama University in Irawa or Iwate, Japan? Does General Dynamics have a division in Texas? Where is Professor Jones teaching now?

If you've ever had difficulty answering questions like these, you need a copy of *ISI's Who is Publishing in Science*® (*WIPIS*). The new *WIPIS* for 1973 includes:

- Names and addresses of nearly 250,000 scientific and technical authors whose articles appeared in the world's most important journals during 1972
- Names and locations of over 40,000 academic, industrial and government organizations whose personnel had articles published during 1972
- Three easy-to-use indexes that make it simple to pin-point just the information you need

You can't anticipate all the ways *WIPIS* can help you—even the information specialists at ISI find new uses for it each year. But you can be sure you'll turn to it again and again for such uses as:

- Getting authors' addresses for reprint requests
- Determining what scientific and technical organizations are located in specified geographic areas
- Seeing whether an author had anything published during the year
- Verifying spelling of authors' names
- Determining what organization an author is associated with
- Locating colleagues
- Contacting speakers and participants for seminars, symposia, etc.
- Differentiating between authors with similar names
- Gauging the size of an organization's research effort by its publishing activity

Now in its sixth year, this unique serial publication is a must for anyone involved with science and technology. And because each *WIPIS* Annual is a supplement to—not a replacement for—previous issues, you should consider obtaining a complete run to assure unbroken coverage (see special offer).

If you've ever wished for an international directory of scientific authors and organizations, stop wishing. Use the coupon. [illegible]

ISI'S WHO IS PUBLISHING IN SCIENCE® (*WIPIS*)*

☐ Please enter my order for the 1973 *WIPIS* Annual at $90.

I also want to take advantage of your special 50% discount** on previously issued *WIPIS* Annuals. Please send me the following Annuals:

WIPIS Annual	Provides Information For	Regular Price	Special Offer**
☐ 1967	Authors who published during 1967	$90	$45
☐ 1968	Authors who published during 1968	$90	$45
☐ 1969	Authors who published during 1969	$90	$45
☐ 1971	Authors who published during 1970	$90	$45
☐ 1972	Authors who published during 1971	$90	$45

Payment for above-checked items is:
☐ Enclosed ☐ In process ☐ Please invoice

*Previously titled: *International Directory of Research and Development Scientists*®.
**Available only to those who purchase 1973 *WIPIS* Annual at the regular price.

Name
Title
Organization
Address
City State
Zip Country

Institute for Scientific Information
325 Chestnut Street, Philadelphia, Pa. 19106, U.S.A.

13-381

INFORMATION
SCIENTIST
or
SYSTEMS
EXPERT

anxious to expand their experience required by architects office. Responsible for collection, storage, retrieval and dissemination of material connected with the built environment. Please write with full details of past experience and qualifications to:

**Halpern & Partners,
John Carpenter House,
John Carpenter Street,
London EC4Y 0AS**

FIRST for carpets
Dodson Bull

UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display
In our extensive London and provincial showrooms
Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 66402
BRISTOL: 2-3 Royal London House, Queen Charlotte St
BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LG.
Tel: Southend 46569
9.00-5.30 Mon.-Fri. Sat. 9.00-12.00 (Manchester 9.00-4.00)

'Micropublishers, reader and retrieval system manufacturers, microform users – in fact, almost everyone connected with the micrographic industry – will find a valuable and convenient reference source in this book.'
Micrographic Weekly

Miniaturised Communications
A review of microform
B. J. S. WILLIAMS

Published by
THE LIBRARY ASSOCIATION
in conjunction with
THE NATIONAL REPROGRAPHIC CENTRE
FOR DOCUMENTATION

£1.50 (£1.20 *to L.A. members*)

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{array}{l}\text{specific}\\ \text{recent}\end{array}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

14 JAN 1974

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib

Proceeding

CALCUTTA UNIVERSITY

ASLIB SCOTTISH BRANCH CONFERENCE, MARCH 1973

Countryside information: a literature review *R. J. Ardern*

Information for environmental planning *Brenda White*

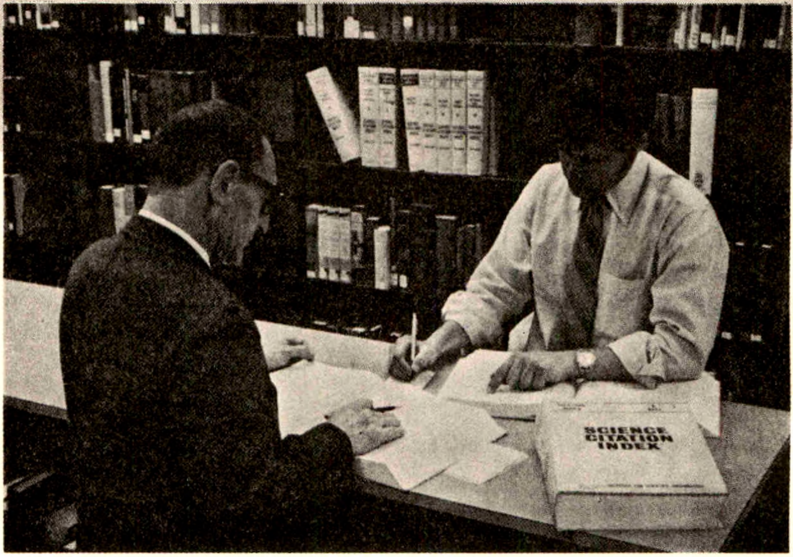
Sources of information on environmental pollution *Nigel Harvey*

The scope for operational research in the library and information field *Martin Elton* and *Brian Vickery*

Report literature in the UK Compiled by *Aslib Information Department*

AUGUST 1973
VOL. 25, NO. 8

SCIENCE CITATION INDEX®...
the reference that sheds a whole new light
on literature searching...



belongs in every scientific library

Science Citation Index — the uniquely effective search tool that organizes the world's current scientific journal literature by the authors' own reference citations — retrieves more pertinent articles on almost any given subject, faster, than any other reference of any kind.

It's the one multi-disciplinary retrospective search tool that serves **all** departments because it covers all scientific subjects with unmatched authority. It's the one reference that finds material that gets lost in the limitations of conventional, subject-oriented literature indexing systems.

SCI® makes use of an indexing system that follows scientists' own traditional method of literature searching — that of locating articles related to their subject interests by examining reference citations of articles known to be relevant. The technique is called "citation indexing". And the **SCI** is the only comprehensive index to the journal literature that offers it.

The **Science Citation Index** is the one standard literature-search reference that no library serving the scientific community can afford to be without. If your library doesn't yet have this most useful of all literature retrieval tools . . . used by libraries large and small . . . bring your search capabilities up to date now. And plan extra sets for branch and departmental libraries where they can do the most good for your entire organization. (Special matching grants are available to smaller departmental and branch libraries to make it economical to obtain multiple sets of **SCI**.)

For more on what the **Science Citation Index** can do for your library, send for our new brochure.

©1971 ISI

isi® **Institute for Scientific Information**
Dept. 13-300, 325 Chestnut St., Phila., Pa. 19106, (215) 923-3300

Aslib Proceedings

VOLUME 25 AUGUST 1973 NUMBER 8

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer-back, Aslib London.

Notes for Contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double-spaced, single-sided, on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

Countryside Information: a Literature Review

R. J. Ardern

Librarian, Highlands & Islands Development Board,
Inverness

Paper presented at an Aslib Scottish Branch Conference, Glasgow, 23rd March 1973

INTRODUCTION

THIS PROMISES to be a most interesting meeting on Information and the Environment. We are all vitally concerned. Most of us live, if not in conurbations, at least in towns and thus the countryside is our antidote; our escape. So, we are all interested in the countryside, we are all interested in planning because it affects us all, and most of us are concerned about pollution if only because we hear so much about it.

The February 1973 report by the Committee for Environmental Conservation on *Urban Pressures in the Countryside* has recommended a Royal Commission on the countryside, calling it the Cinderella of planning. Of course, planning and development are necessary—and pollution is one possible consequence, but the countryside is our heritage—our finest resource and we have a duty to preserve its finest parts for the generations that follow.

The best way to do this is by informed management and usage—and hence the title of this talk. I make no apology for concentrating almost entirely on Britain and mostly on Scotland as I think this will be of most immediate interest to you. Instead of the conventional analysis of the different forms of literature and the different bodies issuing it, I intend to attempt a synthesis, building up the whole picture from the different parts or elements of the countryside. After considering the various aspects of the natural environment we will consider man's impact on this, finally discussing the regional description available to us of the countryside as a whole.

1. THE NATURAL ENVIRONMENT

Geology

No one can dispute that it is in the geology that we have the basis of our countryside pattern. The physiography of Scotland for instance reflects the effect of past earth movements on different rocks, and the subsequent erosional history. The Great Glen is a product of differential earth movements and the Cairngorms are the roots of a mountain mass that was probably one time as high as Mount Etna.

The primary source of information on geology in this country is the Institute of Geological Sciences, which incorporates the Geological Survey and is itself a part of the Natural Environment Research Council. Basic information is provided by the Institute's geological maps, particularly those on the one-inch scale, and by the accompanying memoirs. Maps are issued in solid and drift form, the latter including details of the overburden as well as the rock beneath, so that it is easy to see where rock outcrops and where it is hidden. Full coverage of Scotland is not generally available as stocks were destroyed during the last war and not all sheets have yet been re-issued. The IGS in Edinburgh and certain universities hold full sets of the maps and the old series of memoirs.

There are seven accompanying *Memoirs* currently available for Scotland for a total of seventy-six one-inch sheets, and these provide a detailed written account of the geology of the area covered. More general regional accounts are provided by the *Handbooks of the Regional Geology of Great Britain* of which there are eighteen (five cover Scotland). A new series *Reports of the Institute of Geological Sciences* was inaugurated in 1969 with the object of publishing selected reports more quickly than would otherwise be possible. They have been used particularly for making available the seismic surveys and marine drilling work which have been going on recently around the Scottish coasts stimulated by the interest in offshore oil. Reports in this series of general interest include No. 69/5, *A Summary of the Mineral Resources of the Crofter Counties*, and several on sand and gravel resources in various areas. A full list of current IGS publications will be found in Sectional List 45 published by HMSO and there is a separate map catalogue issued annually.

Other sources of regional geological description are the British Association handbooks produced on the occasion of the annual BA Meetings held throughout the country. The most recent Scottish volume was that produced for the Dundee Meeting in 1968. As these meetings tend to be in the cities, the Highlands and the South West are not covered. Regional excursion guides are produced by bodies such as the Edinburgh and Glasgow Geological Societies and by Dundee Museum and exist for areas such as Ardnamurchan, Arran, Assynt, Edinburgh, Fife and Angus, Glasgow, Strathearn and Tayside. A further series of guides produced by Benham & Co. of Colchester for the Geologists' Association, covers areas such as Skye and NE Scotland.

In Scotland the main comprehensive text is *The Geology of Scotland* edited by Gordon Craig, published in 1965 by Oliver and Boyd at five guineas and reprinted in 1970 at £10! This is a systematic treatment for the whole country progressing from the Pre-Cambrian to the Quaternary with the addition of a chapter on economic geology.

Geomorphology

Turning to the related science of geomorphology or physical geography, this is the province mainly of university geography departments in this country, although in America this would, I believe, be covered by their Geology Departments.

Again there is good coverage in the BA handbooks, and apart from Geikie's classic *The Scenery of Scotland*, there is one fairly comprehensive text, *The Evolution of Scotland's Scenery* by J. B. Sissons, published by Oliver & Boyd in 1967. If the language barrier is no problem there is also a detailed text on North West Scotland, *Recherches de géomorphologie en Ecosse du Nord Ouest* by A. Godard, published in Paris in 1965.

Coastal geomorphology is often kept separate as an area of interest. The Countryside Commission for Scotland have instigated a series of reports from Aberdeen University on the beaches of the Highlands and Islands. The first study on the beaches of Sutherland was carried out in 1969 and the completed report has been followed by others for Caithness, Lewis and Harris, the Uists and Barra, W. Inverness and N. Argyll, and for Wester Ross. The purpose of these studies is to record the nature of the physical resources, the degree of use to which they are subject and consequent ecological problems.

Perhaps the most comprehensive physiographic description of any coastline is to be found in J. A. Steers' *The Coastline of England and Wales* (Cambridge University Press, 1964) which has a companion volume of photographs. A volume on the coastline of Scotland is due to appear in 1973. His 'New Naturalist' volume, *The Sea Coast*, is well known, and his *Scolt Head Island* (Heffer, 1960) is a detailed physiographic and ecological description of a small area of the Norfolk coast.

Most geomorphological description is to be found in the form of university theses and of periodical articles. The former can be traced from publications such as the Aslib *Index to Theses*, and *Scientific Research in British Universities and Colleges* produced annually by the Department of Education and Science and published by HMSO. In addition, a useful list of theses is produced by the Conference of Heads of Departments of Geography in Universities of the British Isles. The current issue is entitled *List of Theses in Preparation 1972/73 and of Theses completed during 1971.*

Periodical articles may be located through abstracting and indexing services, and perhaps the most prominent in the field is *Geo*, formerly *Geographical* and originally *Geomorphological Abstracts* dating from 1960. This is not a quick tool to use and will be described in more detail later.

Meteorology

The importance of the weather and our climate in contributing to the observed countryside, past and present, is often overlooked. Indeed, attempts at classifying landscape and scenic appeal have been made which totally ignore this factor. The effects of weather and climate in helping to shape the landscape are nevertheless well appreciated by geomorphologists and usually by most people who write about the countryside, although some choose to talk only about the halcyon days of cloudless sky and burning sun. It was Ruskin who said 'there is no such thing as bad weather—only different kinds of good weather'.

The Meteorological Office is the main source of information for both weather and climate. Basic data of observations is provided by the *Monthly Weather Report* which contains summaries of observations from about 620 stations in Great Britain and Northern Ireland. There is an annual summary published each year, and a shortened form of the monthly and annual results appears in *The Scotsman* and *The Times*. There is also an annual and expensive book entitled *British Rainfall 1965*, 1965 being the latest edition published—an intolerably long timelag.

Climatic averages are provided in separate booklets for humidity, bright sunshine, temperature and rainfall for the period 1931–60 (1916–50 for rainfall). Again, these badly need updating and one wishes the Met. Office could speed up its publishing programme. Another publication in this area is *Tables of Surface Wind Speed and Direction over the U.K. 1968.*

An extension of the data contained in the standard works outlined above may sometimes be found in the typescript *Climatological Memoranda* and *Hydrological Memoranda* prepared by the Met. Office, and which are listed separately from Sectional List 37, with the Scottish volumes available only from the Edinburgh Met. Office. Useful examples include *1931–60 Averages of Temperature and Sunshine* for stations not included in the standard work already mentioned, *Frequencies of Snow Depths for Given Ranges at Selected Stations in Scotland* and several volumes on the climate of small areas of Scotland including Edinburgh, Glasgow and the coastal region of the Moray Firth. *Hydrological Memoranda* include several volumes on rainfall for the period 1916–50 for water areas, e.g. Solway to Loch Linnhe, and Dee and Don to Tweed.

A useful publication is the magazine *Weather* which is highly readable to the layman and contains articles from all over Britain. There have, for example, been several on snow depths in the Cairngorms.

Anyone requiring detailed information on a particular area which may not be conveniently available in the sources outlined would be well advised to get in touch with the Edinburgh Met. Office in Palmerston Place which has much unpublished information available.

Finally, a useful general text on the British climate which contains many references to the countryside in different parts of Britain is Gordon Manley's *Climate and the British Scene,* one of the 'New Naturalist' series. Chapters such as 'Landscape features and their effect on altitude' give much useful information.

Providing a link with our next theme are three very interesting and attractive maps prepared by the Macaulay Institute for Soil Research. All three are entitled *Assessment of Climate Conditions in Scotland.* They are based on accumulated temperature and potential water deficit (of soil), exposure and accumulated frost, while the third is a composite picture entitled the 'Bioclimatic sub regions of Scotland'. The maps are on a scale of 10 miles to the inch and most attractively produced in folders with descriptive notes.

Soils

The two main sources of information on soils are the Macaulay Institute for Soil Research in Aberdeen founded in 1930 and the Rothamsted Experimental Station in Hertfordshire. Other bodies which can provide information on soils are universities, such as Aberdeen which have Soil Science Departments, and the Forestry Commission.

The Soil Survey is administered by the Macaulay and Rothamsted Stations for Scotland and England and Wales respectively. Mapping is carried out on a scale of 2½ inches to the mile and, although in England a new series of *Soil Survey Records* (maps and accompanying monographs) have been produced at this scale, in Scotland most of the published work is shown on one inch maps and the monographs conform to the areas of these sheets.

Most of the agriculturally important areas of lowland in Scotland have now been mapped and monographs are available to accompany the published sheets. The Macaulay's latest annual report gives a useful summary of progress and an index map of what is available. It should always be remembered that the Soil Survey people work in other areas when commissioned. Thus, if the enquiry is for information on soils in the neighbourhood of a new town or a new industrial site or a bridge, for example, the appropriate bodies such as the New Town Development Corporation may hold just the required information, even though it is not published.

A particularly well documented area is Scottish Peat. A peat survey was carried out in the fifties by the Scottish Peat Committee and the results have been published in four regional volumes by HMSO between 1964 and 1968. For each moss surveyed, there are useful general descriptions of the area including information on geology, rainfall and plant species.

The animal and plant environments

There are many bodies at work in this field, perhaps the most important being the Nature Conservancy. The breadth of their interest is apparent from publications such as *Research in Scotland 1968–70* and *Range Ecology Research, 1st Progress Report 1971*, which is to be the forerunner of regular triennial reports. The Conservancy have undertaken a massive nationwide review of Sites of Special Scientific Interest, and this is shortly to be published. At their Monks Wood Research Station they maintain a Biological Records Centre for the collection and storage of records of the distribution of plant and animal species throughout Britain.

The distribution of Britain's vegetation is shown in the *Atlas of British Flora* (Nelson, 1962) and the subsequent *Critical Supplement* (Nelson, 1968), both by Perring and Walters. *The British Isles and their Vegetation* (CUP, 1939) by Sir Arthur Tansley, first Director General of the Nature Conservancy, remains a classic in this field, and we should not forget the *Excursion Flora to the British Isles* by Clapham, Tutin and Warburg, 2nd rev. ed. (CUP, 1968).

The Second Land Utilisation Survey of Great Britain has, besides mapping agricultural and urban land use patterns, also mapped natural or unmanaged plant communities and is to publish a *Wildscape Atlas* for England and Wales. Volume 1 on land use and conservation is due to appear during 1973.

The definitive work for Scotland is Burnett's *The Vegetation of Scotland* (Oliver & Boyd, 1964). After preliminary chapters on climate, soils and the history of Scottish vegetation studies, the treatment follows the different plant communities, ending up with a chapter on the regional patterns of vegetation in Scotland.

The Nature Conservancy Monograph No. 1, *Plant Communities in the Scottish Highlands* (HMSO, 1962) by McVean and Ratcliffe is an advanced text covering mostly upland vegetation. More restricted in its subject area is *The Native Pinewoods of Scotland* (Oliver & Boyd, 1959) by H. M. Steven and A. Carlisle. Much of this work is a region by region description of the woods and there are useful chapters on the history of Scottish forests, particularly the effect of man, and on the ecology of pinewoods as a group.

The publications of the Forestry Commission are listed in Forest Record

No. 58, *Check List of Forestry Commission Publications 1919–65*, which can be updated by Sectional List No. 31. Besides the *Forest Park Guides*, booklets such as *Know Your Conifers* and *Know Your Broadleaves* are highly informative, together with *Forestry in the Landscape* and *Forestry in the British Scene* and the series of booklets on birds and animals of the woodlands.

The 'New Naturalist Series' is a particularly valuable natural history library and cannot be too highly praised. It is inexcusable that so many of the titles should have remained out of print for so long, but the situation has improved in the last few years with the appearance of several new editions and some additions to the series. Turrill's *British Plant Life* has much of value to say about the historical, geographical and ecological aspects of our vegetation, while more restricted in coverage are volumes on wild flowers, mushrooms and toadstools, weeds and aliens, together with many titles on animals, birds, butterflies, insects and marine life and also studies of single genera in the 'New Naturalist Monographs Series'.

Definitive regional guides to fauna are vastly outnumbered by popular books of the type *Naturalist in Speyside* and *Wild Highlands*. *A Regional Guide to the Birds of Scotland* by Kenneth Richmond (Constable, 1968) suffers from the impossibility of predicting where birds will go, so that any one observer cannot expect to see all the species mentioned for any one area and may well see several species not mentioned. Another regional book is *Highland Birds* by Desmond Nethersole-Thompson (HIDB, 1972) which is to be followed by *Highland Animals* by David Stephen due for publication this summer.

Information can be spread over a great area, and much material of value appears in general periodicals such as *The Countryman* and *Country Life*, besides more obvious titles such as *Birds* or the *Journal of Ecology*. Some studies arise out of a particular threat which has appeared, one such being the Moray Firth Development Ecological Survey reports which have been commissioned from Aberdeen University Geography Department by Ross-shire County Council and the HIDB. Four excellent interim reports have been received so far, and it is hoped that the final report will be published after the study ends in 1974.

The work of local natural history societies should not be underestimated. A full list of these societies appears in Dudley Stamp's *Nature Conservation in Britain* which is one of the additions to the 'New Naturalist Series'. Local societies often have as one of their main objectives the production of a flora and fauna of their district.

Turning finally to the marine environment, C. M. Yonge's 'New Naturalist' volume, *The Sea Shore*, is a classic in its field, whilst *Nature Conservation at the Coast* (HMSO, 1969) was produced by the Nature Conservancy as a complement to the Countryside Commission's series of volumes on the coastline of England and Wales.

Drawing partly upon the work of the Scottish Marine Biological Association at Dunstaffnage near Oban is P. H. Milne's *Hydrography of Scottish West Coast Sea Lochs* (HMSO, 1972) in the series 'Marine Research'. Its freshwater equivalent is the classic *Bathymetric Survey of Scottish Freshwater Lochs* by Murray and Pullar, published in 1910. For those to whom no fish is too large to swallow *The Search for Morag* (Stacey, 1972) by Elizabeth Campbell and *The Loch Ness*

Monster by Dinsdale (2nd ed. Routledge, 1972) should provide some, but not all, of the answers to questions on the existence of monsters. If you agree that truth is stranger than fiction, we could add Compton Mackenzie's *The Rival Monster* to the list!

2. MAN IN THE COUNTRYSIDE

The total effect of man's impact on the natural environment, from the first stone age hunters to our present planners and developers, is bequeathed to us at this point in time to make what we term the countryside. This countryside is quite different in many respects from the countryside known by our forefathers—quite different for example from that known two hundred years ago by Dr Johnson on his Journey to the Western Islands and quite different from that known to Agricola on his march up Strathmore, which culminated in the battle of Mons Graupius. Most obviously the countryside has been restricted in areal extent by the encroaching towns and motorways and greenfield sites for industry. It has been gradually deforested, drained and brought under the plough, only in some areas to revert back to sheep! The landscape surveyors of the past have created the fields we know today, and so the process goes on—the countryside is never still—it is constantly changing.

Something of the historical past is almost always reflected in the landscape of the present, at least to those who can read and interpret the signs. This is how our knowledge of the past has advanced where the written record is absent. I propose now to discuss the man-made countryside under four headings—agriculture and land use, land surveys, ancient monuments, historic buildings and houses, and, finally, place-names.

Agriculture and land use

The Land Utilisation Survey directed by Dudley Stamp in the 'thirties was written up in ninety-two county volumes, so that no part of the country was left uncovered. The second Land Utilisation Survey started in 1960 and is progressing more slowly. Maps are on a 2½ inch scale and those published so far are mostly for England and Wales. Much of the work has been carried out by senior geography classes in schools and, although it may not have reached the stage of publication, much work may be available in the schools themselves or in the local library.

Stamp's survey was summarized and the results analysed in *The Land of Britain—its use and misuse* (Longmans, 1962). For the Highlands a more up-to-date report on land use appeared from the Advisory Panel on the Highlands and Islands in 1964, entitled *Land Use in the Highlands and Islands* and published by HMSO. At about the same time there appeared in *Advancement of Science* for July 1964 a collection of articles edited by Dudley Stamp under the similar title *Land Use in the Scottish Highlands.*

Statistics on the areal extent of different land uses are available from the following sources: the Department of Agriculture and Fisheries for Scotland for the annual *Agricultural Statistics, Scotland*; the Ministry of Agriculture, Fisheries and Food for *Agricultural Statistics, United Kingdom*—the latest available being for

1968/69; and the Forestry Commission for *Census of Woodlands 1965/7*, all published by HMSO.

Land surveys

The agricultural countryside we know today owes much to the work of the land surveyors of the eighteenth and early nineteenth centuries. The records of this work are mostly to be found in the Scottish Record Office in the form of plans and maps. Catalogues of these collections have been issued in two volumes as *Descriptive list of plans in the S.R.O.* (HMSO, 1970). There are two interesting articles in the *Scottish Geographical Magazine*—for 1964 J. B. Caird on the making of the Scottish rural landscape, and for 1968 I. H. Adams on the Land Surveyor and his influence on the Scottish rural landscape. This latter article is in the December 1968 issue which contains a useful Scottish Countryside Symposium of six articles.

Ancient monuments, historic buildings and houses

Much of the interest of the countryside stems from the discovery of the unexpected or the unusual and here ancient monuments, historic buildings and houses hold great interest. The Royal Commission on Ancient and Historical Monuments in Scotland are publishing a series of inventories county by county and these are definitive works. The most recently published is the volume for Kintyre wherein coverage extends up to and including the eighteenth century, with notes on selected buildings of more recent origin. For the prehistoric period a very useful gazetteer with summaries of each site and references to the literature is Feachem's *A guide to prehistoric Scotland* (Batsford, 1963) and unfortunately now out of print. Reports on sites of all ages will be found in *PSAS*—the *Proceedings of the Society of Antiquaries of Scotland* from 1867 to date.

Classics in their field are the two treatises by MacGibbon and Ross on the ecclesiastical architecture of Scotland and the castellated and domestic architecture of Scotland. These have been recently reprinted by the Mercat Press. Nigel Tranter's *The Fortified House in Scotland* (Oliver & Boyd, 1962–1971) has run its course to the projected five volumes. Stuart Cruden's *The Scottish Castle* (Nelson, 1963) is scholarly, whereas W. Douglas Simpson's *The Ancient Stones of Scotland* (Hale, 1965) is more popularly written. Unfortunately in Scotland we do not have anything to compare with Pevsner's *Buildings of England* series.

Besides a guidebook or leaflet for every ancient monument, HMSO publish a selective *Illustrated Guide to Ancient Monuments,* vol. 6 of which is for Scotland. They are also booklets in a similar style on Scottish castles and Scottish abbeys.

Place names

Place names are a fascinating subject. Two comprehensive works for Scotland are Watson's *The History of the Celtic Place-names of Scotland.* (Blackwood, 1926) and *Johnston's Place Names of Scotland* (3rd ed., John Murray, 1934). Both have recently been reprinted. Some of the derivations given in these works are now discredited and much recent work has been done at the school of Scottish Studies by W. S. H. Nicolaisen and latterly by Ian Fraser. This work is published in *Scottish Studies* and there is a regular column in the *Scots Magazine.*

There are volumes too for local areas, such as Alexander's *Place Names of Aberdeenshire* (Third Spalding Club, 1952) and Marwick's *Orkney Farm Names* (The Orcadian, 1952). Mention should also be made of the BBC's *Pronouncing Dictionary of British Names* (OUP, 1971).

Landscape

Landscape is a composite picture based on visual appeal. There have recently been attempts at its classification, which have not met with unqualified success. The *Planning Classification of Scottish Landscape Resources,* prepared by Land Use Consultants for the Countryside Commission for Scotland, seems to ignore for example the vagaries of the Scottish weather and assume that landforms will (a) always be visible and (b) present the same impact in different kinds of weather. Linton's 'Assessment of Scenery as a Natural Resource', in the *Scottish Geographical Magazine* Countryside Symposium issue, seems biased towards mountainous areas, while Murray's *Highland Landscape* (National Trust for Scotland, 1962) basically underlines the National Park Direction Areas of 1945.

While talking of landscape, we should not neglect the field of landscape architecture where Brenda Colvin's *Land and Landscape* (John Murray, 1969) might be mentioned.

The Making of the English Landscape by W. G. Hoskins (Hodder & Stoughton, 1955) has been much praised. It is the forerunner of a series of the English counties which are now beginning to appear again after a halt of several years. Unfortunately, there is no comparable work for Scotland.

Preservation of the historic living countryside

Preservation and conservation are the responsibility of bodies such as the Department of the Environment and planning authorities, all advised and coerced by the two Countryside Commissions. Following the Scott Report—*Report of the Committee on Land Utilisation in Rural Areas,* Cmd. 6378 of 1942, the *National Parks and Access to the Countryside Act of 1949* set up National Parks in England and Wales, and while National Nature Reserves were created in Scotland, and Forest Parks continued to be created, no National Park legislation appeared for Scotland where the pressures on rural land were less. The second 'Countryside in 1970' Conference recommended the creation of a Countryside Commission for Scotland. Under the *Countryside (Scotland) Act* of 1967 such a Commission was duly set up with obligations concerning the provision, development and improvement of facilities for the enjoyment of the Scottish countryside and for the conservation and enhancement of the natural beauty and amenity thereof. The Commission are to have due regard to the need for the development of recreational and tourist facilities and for the balanced economic and social development of the countryside.

Besides the landscape classification report, and the reports on beaches in the Highlands, they have issued reports on footpaths and disused railways in the countryside and on Speyside, where they have developed the idea of a ranger service to manage recreational pressures. Their 4th report for 1971 contains a useful appendix listing studies commissioned since 1968 and publications for 1971.

One of the most useful publications from the Commission is *Scotland's Countryside 1970*, produced for the European Conservation Year, with a new edition produced in 1972. Short articles on Scotland's scenic heritage, and education in and interpretation of the countryside are followed by a county by county gazetteer of places of interest and a supporting map section.

The English Countryside Commission has a wealth of reports and documents to its name. The Commission was engineered out of the old National Parks Commission and thus did not have to start from scratch. They publish the monthly *Recreation News* which will reach its fiftieth issue in April. This newsheet details the latest developments and literature and lists newly established country parks and picnic sites. To the October 1972 issue was appended a full list of the Commission's advisory publications. These include a series of nine reports on the coasts of England and Wales with supplementary reports, *Nature Conservation at the Coast,* already mentioned, *The Planning of the Coastline* (HMSO, 1970) which outlines a future co-ordinated land use policy for the coast and *The Coastal Heritage,* which suggests a conservation policy for thirty-four areas of the highest quality scenery, which together make up about a quarter of the whole coastline. Another interesting report published by HMSO for the Commission is Dr Appleton's *Disused Railways in the Countryside of England and Wales* (1970) on the uses to which these lines may be put. This report has been most energetically followed up by Lindsey County Council with their report *Disused Railways in Lindsey; a policy for after-use* (1971).

The Commission has published well over thirty other advisory pamphlets, which are all free at present. One of the most valuable of these is the *Countryside Recreation Glossary, 1970.* They have however become cost conscious with the fifth and latest edition of their *Research Register.* This is a most useful annual listing of ongoing and completed research studies on the countryside.

Also of great value is the *Countryside Information Directory,* in a loose leaf format to facilitate periodic updating, although this has occurred only once, as yet, since publication in 1971. Herein will be found the addresses and work of bodies as diverse as the Scottish Development Department and the Offa's Dyke Association, or the Ordnance Survey and the Outward Bound Trust. 'Men of the Trees' follow 'Men of the Stones' to accompany the 'British Pteridological Society' and the 'Broads Consortium'.

The Countryside Commission also aims to provide a clearing house service for information about the Countryside. It started a feature card system for the storage and retrieval of technical and general information in the form of short abstracts of research studies, books, papers, pamphlets and films in the field of countryside recreation and conservation. It also acts as the UK correspondent to the Council of Europe's Information Centre for Nature Conservation.

So much for statutory bodies. Interest in the countryside is such that there are countless voluntary organizations all with the aim of conserving some aspect of our environmental heritage or of promoting some kind of recreation using these resources. The various local naturalist groups are well documented in the *Countryside Information Directory* and in Stamp's *Nature Conservation in Britain.* Many are affiliated to national bodies, such as the Field Studies Council or the Scottish Wildlife Trust. National publications from the former include field studies reports in various disciplines based on the area around the established Field Centres. Unpublished information can often be obtained from the local secretaries of voluntary bodies.

Some voluntary organizations are limited to specific areas such as Friends of the Lake District and the Offa's Dyke Association; others such as the Civic Trust and the National Trust and National Trust for Scotland are nationwide, and are large as such organizations go, with a greater publishing output. The National Trust for Scotland, for example, publishes a large number of interesting guides, such as *Places in Perthshire, The Atholl Way: a description of the road from Dunkeld to Blair Atholl, Torridon* and *Kintail, Balmacara and the Falls of Glomach*. The excellent book *The Life and Death of St. Kilda* (1965) should also be mentioned.

Recreation and enjoyment of the countryside

There is no need to dwell on the increase in leisure and the daily greater demands being placed upon the countryside as a recreational resource. There is a complementary upsurge in the literature, and tourism and recreation are now popular subjects for theses and for reports of all kinds. There is a growing literature control problem; hence the Aslib Conference in October entitled 'Sources of Information on Recreation, Leisure and Tourism', the proceedings of which are to be published shortly.

In *Sourcebook of Planning Information* (Bingley, 1971) Mrs Brenda White gives a good account of the recreation, leisure and tourism studies which have been carried out, particularly since Michael Dower's Civic Trust survey of 1965, *Fourth Wave: the challenge of leisure*. Research on recreation provision is coordinated by CRRAG, the Countryside Recreation Research Advisory Group, while the Countryside Commission's *Research Register* has already been mentioned. Good bibliographies on recreation and leisure will be found in *Planning Outlook* for 1967 and in Patmore's *Land and Leisure in England and Wales* (David and Charles, 1970). Burton and Wibberley's *Outdoor recreation in the British Countryside* (Wye College, 1965) is also a useful general survey.

Turning to areal studies in this field I would like to mention just one, Millman's *Outdoor Recreation in the Highland Countryside*, 1971. This is a large lithographed work and copies are still available from the HIDB. Chapter 3 on the historical development of the Highland countryside outlines the modern patterns of recreation within the area and chapter 4 takes ten areas as separate case studies to show the different patterns of estate management which permit differing public recreational uses, and this is developed in a later chapter where degrees of accessibility are considered. One of the appendices lists recent recreational developments.

3. REGIONAL DESCRIPTION

Finally, I would like to give a brief outline of sources of regional description.

Topographical bibliographies are the starting point. We are fortunate to have Mitchell & Cash's *Contribution to the Bibliography of Scottish Topography* (Scottish History Society, 1917) and Hancock's continuation, *A Bibliography of Works Relating to Scotland 1916–50* (Edinburgh University Press, 1959/60).

There is no subsequent updating published, but a manuscript record is, I believe, being kept by the National Library of Scotland. The National Book League's *Reader's Guide to Scotland* (1968) and *The Highlands and Islands of Scotland* (2nd ed., 1971), go some way towards filling the gap, although the latter only lists books in print. There is rather a lack of regional bibliographies at present—they seem to be out of fashion. For the Highlands, the best single listing we have is in Turnock's *Patterns of Highland Development* (Macmillan, 1970).

Surveys such as the British Association handbooks have already been mentioned. The 3rd Statistical Account of Scotland has taken an inordinate length of time to appear. Many of you have probably written it off, but I gather that it is still hoped to produce the Dundee and Angus volumes and I have been assured that work is continuing on the Inverness volume. Caithness Books are hoping to issue some of the unpublished material for the North. Also in the North, the lack of the Statistical Account is partly offset by publications subsidized by the County Education Authorities, namely, *The Shetland Book* (Zetland County Council, 1967), *The New Orkney Book* (Nelson, 1966) and the *Caithness Book* (Highland Printers, 1972). The Statistical Account provides regional thematic summaries and parish by parish accounts, whereas these county books are entirely thematic.

Planning surveys often have a useful, if not always accurate, history and description of the area. Some of the more interesting are *Royal Grampian Country* (Aberdeen University, 1969) the *Moray Firth* by the Jack Holmes Planning Group (HIDB, 1968) and the *Cairngorm Area* (HMSO, 1967). A classic in its own right is Fraser Darling's *West Highland Survey* (Oxford UP, 1955).

Regional description for the general reader is provided by the regional 'New Naturalist' volumes, the 'National Park Guides' (would there were something as good as these for parts of Scotland), the David and Charles' 'Islands Series', which sometimes contain surprising errors, and the 'Portrait' series published by Robert Hale. The Companion Guides published by Collins and the Scottish Youth Hostels Association guides are useful, while the *Shell Guide to Scotland* and the *A.A. Book of the Seaside* are national in coverage.

Thematic guides are legion, and include those for forest parks, long-distance footpaths, Scottish hill tracks, nature reserves, ancient monuments, guides of the Scottish Mountaineering Club and May Cowan's book on Inverewe (Bles, 1964).

Periodicals can be crudely divided into two: the academic, and the glossy or enthusiasts' magazines. There is no 'Countryside Abstracts' to provide bibliographic control over both kinds. The academic journals tend to be abstracted in services such as the *Department of the Environment Library Bulletin,* the RICS Technical Information Serivce and *Geo Abstracts.*

The *Department of the Environment Library Bulletin* is a useful fortnightly publication with annual author and subject indexes. It covers selectively the intake of the library system which once serviced the Ministries of Transport and of Housing and Local Government. In most cases a short abstract is provided and countryside information is to be found in the Planning and Land Use Section, under the headings Countryside, Geography, Historic Buildings, Recreation and Tourism, and Regional Planning.

The Technical Information Service of the Royal Institution of Chartered Surveyors is produced in several formats. There is a *Weekly Briefing of News Selected from the Press* and a monthly *RICS Abstracts and Reviews,* which is supplied with a cumulative index every quarter, and the triennial issue for 1970–72 has recently appeared. Countryside information is found in both publications under the heading Conservation and the Environment, and under other headings such as Agriculture, Forestry, and Planning and Development.

Another abstracting service with items relevant to the countryside is *Geo Abstracts.* This is not the easiest of tools to use, on account of its typography and the time lag before indexes appear. The abstracts are not very up to date as the publication relies on volunteers to do the abstracting. There are six parts to this service: A. Landforms and the Quaternary; B. Biogeography and Climatology; C. Economic Geography; D. Social Geography and Cartography; E. Sedimentology; and F. Regional and Community Planning. All except the Sedimentology volume are relevant to the countryside.

Much of the information on the countryside is less academic in slant and the average enquiry at the Public Library Counter would be for something on the birds of St. Kilda or the flowers of Mull. Such information appears in *Scottish Birds* and similar enthusiasts' magazines and in general magazines such as *Scottish Field* and *Country Life.* Some of these are abstracted in *British Humanities Index,* while the Scottish Room of Edinburgh Public Library maintains a card index to *Scottish Field* and *Scotland's Magazine,* but not the *Scots Magazine,* although I see this latter now figures prominently in the annual bibliography in *Scottish Studies.*

Unpublished reports are a problem. Gaining knowledge of their existence may rely on pure chance and good contacts. The only course is often to approach the most likely institution or person and ask if they have anything on the subject in hand. (A useful library school thesis might be to try and draw up a National Register of Experts!) Theses are another difficult category. We have already mentioned several guides to theses, but undergraduate ones are not covered by any national list.

Topographical maps are indispensable in all regional work, and the Ordnance Survey one inch, 2½ inch and 6 inch maps are most useful, depending on the scale required. It is a pity that the new 1:50,000 map to be introduced to replace the one inch will be just an enlargement of the present maps, which are based on surveys completed in the 'fifties, and will not incorporate the recent resurvey of the Highlands. Also, if Aslib has not already done so, it would be useful for them to add their voice to the protest over the proposal not to proceed with a complete issue of the new 2½ inch series. Covering twice the area of the old series, these maps are now of much greater value to the walker, and librarian, and more attractively produced.

Photographs, art, music and recorded sound all have their part to play in any informative picture of the countryside. The most obvious use of recorded sound in the countryside is in capturing bird song, while photographs and particularly air photographs capture a moment in time and provide a permanent historical record. *Scotland from the Air* by Glen and Williams (Heinemann, 1972) and *Scotland from Victorian and Edwardian Photographs,* edited by Minto (Batsford,

1970) should leave nobody in any doubt as to the value of photographic collections in libraries. Air photographs are available from organizations such as Aerofilms, while the Scottish Development Department maintain a Central Register of Air Photography of Scotland. Cambridge University and the Department of the Environment also have large collections, while the latter has recently produced a catalogue to its slide library.

Conclusion: the need for control

Having completed our survey of countryside information sources, I would like in conclusion to reiterate two areas where there is a need for control.

The labour of compiling regional bibliographies is great, but their value in any search for countryside information would be enormous. Perhaps after the reform of local government the new district and regional library services will be able to work something out with the aid of the universities. It is a pity that the regional volumes of *British Humanities Index* were stopped during the 'fifties.

More pressing is the need for a Countryside Abstract service to monitor reports and periodicals. The English Countryside Commission has greater resources than the Scottish, but if the two could get together and use their information records the result would be useful to the increasing number of researchers in this and similar fields, to planners, and to the general public. A similar kind of service, which might act as a model, is already provided by the United Kingdom Documentation Centre for Sport, Physical Education and Recreation at Queen's University, Belfast. It would be a big task, but surely this is partly what the Countryside Commissions were established for.

Information for Environmental Planning

Brenda White

Planning Research Unit, University of Edinburgh

Paper presented at an Aslib Scottish Branch Conference, Glasgow, 23rd March 1973

I TRADITIONALLY begin a paper with one or more definitions. This is not pedantic but a matter of necessity if one is to communicate efficiently, particularly nowadays when loose terminology and imprecise usage of words is very much in evidence. Ask ten people what they understand by planning, and you will get ten variations on a theme; ask ten people what they mean when they talk about 'the environment'—which everyone does—and you will find not ten variations on a theme, but ten themes.

So I want to try to pin down environmental planning. I must confess that this is the first time I have spoken about environmental planning. I have given papers on planning, on urban planning, and on urban and regional planning. The theme of all these was very much the same as the theme of this paper: which is planning in the sense of the allocation of resources within specified geographical areas and the apportioning of land between competing uses, all in accordance with a set of defined goals or objectives. Basically, this is land use planning. But, although the use of land is the basis of planning, many planners have come to feel that an emphasis on land accentuates the physical side of planning—the architectural and engineering concept which prevailed in general throughout the first half of this century and longer in some quarters—and the notion that environment is synonymous with built environment. It would be more accurate now to say that the allocation of land and the creation of a physical environment is only the basis on which a programme of social goals can be founded, with the object of providing a better community life. This is what planning in the 1970s is about. If it might seem otherwise to people living beside a major motorway, this is because the road schemes currently under construction in British towns were conceived many years ago; the new line of thinking can be clearly seen in the 1972 report of the Urban Motorways Committee[1] and the White Paper on development and compensation which is significantly sub-titled 'putting people first'.[2]

We are concerned, therefore, with the sources of information relating to an activity whose objective is the creation of a decent social, economic, and physical environment, and which I shall now refer to simply as planning. An activity whose focus is as wide as this has an equally wide information base: planning is an interface of economics, sociology, geography, psychology, civil and municipal engineering, architecture, traffic planning, and a great deal more. Increasing use of mathematical techniques has brought in an associated literature; the systems approach to planning, which sees the process as an attempt to impose controls on a constantly-changing social system, is based in the literature of cybernetics and information theory, and systems analysis. All this in addition to the core of information which could be called pure (for want of a better word) planning. Thus, when we speak of planning information, we are speaking of an amorphous mass which has an identifiable hard centre but whose boundaries are ill-defined and continuously expanding and fluctuating.

It is largely due to this diffusion and continuous state of flux that there are so few reference books devoted to planning—the subject is so hard to pin down, that anything which attempts to impose a structure, or a set of standards upon it, is out of date before it is written, let alone published, and would almost certainly not be accepted by many planners. There never has been a dictionary of planning: the nearest published approach is the *International glossary of technical terms used in housing and town planning* published in a second edition in 1951 by the International Federation of Housing and Town Planning at Amsterdam. This is simply an alphabetical sequence of terms in English, French, German, Italian and Spanish, each term having against it the equivalents in the other languages. A new edition of the glossary has been in preparation for many years, but it appears that resources are not available to complete and publish it.[3] Terms and phrases are defined selectively in various publications of the Department of the Environment and of its component part, the former Ministry of Housing and Local Government, but these are scattered; there seems also to be a trend towards authors including glossaries in books, particularly those which discuss technical aspects of planning, but there is no standard for this type of listing and definitions can vary widely from book to book.

Nor has there ever been a general encyclopedia of planning in English, although this situation will soon be remedied—24th May is the publication date for the *Encyclopedia of town and country planning* by Graham Ashworth, published by Barrie and Jenkins. Graham Ashworth is Director of the Civic Trust for the North West and Senior Vice-President of the Royal Town Planning Institute, and as well qualified as any to undertake the compilation; but the advertised price of £3.50 suggests that the coverage is selective, and it will be most interesting, in fact, to see exactly what the contents are.

Another deficiency in planning is what in some fields of study are called 'standard texts'. The only British book of which I am aware which actually called itself a textbook was the old *Town and country planning textbook,* compiled under the auspices of the Association for Planning and Regional Reconstruction and published in 1950 by the Architectural Press. This brought together an impressive line-up of contributors, whose papers were grouped into six sections, on geography, planning survey, social survey, transport, industry and power, and law and economics. These six topics represented the sum total of planning theory and practice almost a quarter of a century ago. The modern standard text is Lewis Keeble's *Principles and practice of town and country planning* first published in 1952 and now in a fourth edition, which incorporates the sweeping legislative changes of 1968.[4] While this is the only reasonably up-to-date statement of the general principles of practical town and country planning, it is a very physically-biased view and by no means in line with current broader-based thinking. A very comprehensive statement of American theory and practice is available in Goodman and Freund's *Principles and practice of urban planning*,[5] which makes for interesting comparison with Keeble's volume, since the two conceptions are totally different.

A deficiency of textbooks and reference books there may be, but there is certainly no deficiency of books, for planning seems to be something of a growth area in book publishing nowadays. Several publishers have an 'urban and regional' series running, in some cases based on the output from a university. Allen and Unwin, for example, publish work from the Centre for Urban and Regional Studies at Birmingham University under an *Urban and regional studies* imprint, in addition to their *Glasgow University social and economic studies* which presents the work of that University's Department of Social and Economic Research, which is highly relevant to planning. Cambridge University Press have instituted a series of *Urban and architectural studies* whose main contributor will be the Centre for Land Use and Built Form Studies at Cambridge University. Heinemann Educational Books have begun a series to contain work produced from, or sponsored by, the Centre for Environmental Studies. Pergamon Press is now a major producer of urban and regional texts, though their main series is not tied to any particular source. The majority of these series are presenting research results, and it hardly seems necessary to rehearse again the inevitable time lag between the collection of data and their appearance in processed form in hard print, usually between hard covers. Pergamon are this year launching a new series under the title *Progress in planning* which aims to alleviate this problem by offering quick, paperback publication of texts of between 20,000 and 40,000 words reporting up to the minute research results—quicker, they claim, than the average academic journal can offer.[6]

This type of book, I imagine, is intended for a professional audience, and this of course means students as well as practitioners and other research workers. Certainly, an understanding of it presupposes some relevant specialized knowledge. It is always dangerous to categorize but I would broadly divide the rest of the book literature of planning as (a) practical manuals intended for a professional, practitioner audience; (b) descriptive and critical studies, intended sometimes for a professional and sometimes for a lay audience, sometimes for both; (c) speculative, pseudo-sociological writing, intended for an unspecified readership.

There are now a fair number of practical manuals in subjects relevant to planning: in land economics, for example, in model-building, in landscape design, in village planning, in designing children's playgrounds, in traffic and transportation planning, in urban conservation. These should not be confused with textbooks: a textbook sets out the principles and the standard practice in accordance with these principles; these practical manuals are one man's idea of how it should be done based on that one man's experience and reading. The remarkable feature of them is the variety between them, even between volumes with almost the same title. To take just one example, 1970 saw the publication of two volumes on transportation planning. Michael Bruton's *Introduction to transportation planning* is a slim book, published by Hutchinson, which is nothing more nor less than a straightforward description of the basic techniques of the process. Roger Creighton's *Urban transportation planning*, published in America by Illinois University Press, is concerned with the same basic techniques, but the volume is three times the size of Bruton's, and in a much more discursive treatment it attempts to relate transportation and its planning to the overall planning process. This comparison is by no means intended as a criticism of either book; it is simply to point out that there is no formula—just as there is no formula for individual planners—and that the scope is infinite.

The second category, that of descriptive and critical studies, covers a multitude of sins. These are the books which tell you how it works, or how it has been done, rather than how to do it yourself, as the practical manual sets out to do. They include histories of planning which in fact are usually histories of cities and urban development, and these range from Gutkind's massive eight-volume *International history of city development*[7] down to studies of town planning in a single town in a single period, such as Youngson's *The making of classical Edinburgh*[8] or Sir John Summerson's *Georgian London.*[9] What is remarkable about the history of planning is that, while Gutkind represents about the last word in research and scholarly detail and his volumes will certainly be a standard reference source for many decades, there are so many gaps. So many countries are undocumented; in Britain, only a handful of towns have been documented at all, and these only over relatively short periods. Even London, about which so much has been written, cannot boast a full history of its development or its planning. The category also includes studies of how the planning machine, and the various processes involved in it, work in practice. Here the standard work is Cullingworth's *Town and country planning in Britain,*[10] now in a fourth edition, and this has been supplemented by detailed studies, such as *Local government and strategic choice*[11] by Friend and Jessop, which observes the workings of the planning department in Coventry during the review of the city's development plan, and which makes fascinating reading for anyone involved in local government and anyone interested in the process of decision-making generally. We could also take in here the now weighty documentation on the effects of planning on people and things, on the effects of traffic on towns, on the effects of recreation on the countryside, on the effects of man on the environment, some of it purely descriptive, some violently critical, some constructive.

The third category, that of the pseudo-sociological and speculative literature, cannot by and large be regarded as a genuine source of information on environmental planning. It includes all the hundreds of thousands of emotive words written under titles like 'the urban crisis' or 'the urban dilemma' or 'cities in chaos'. It includes all the doom-laden prophecies uttered under titles containing the word 'environment'. Much of this literature issues from the United States, where the urban crisis has become a national preoccupation, and the environment is popularly typified by photographs of the smog over Los Angeles and traffic jams on eight-lane highways. There is such a mass of this material nowadays that it is a very real problem trying to select the few items that are worthwhile, in that they attempt a reasoned analysis of a situation, or a reasoned set of pointers to future action. If anything is certain, it is that anyone who selects by title alone is in for a lot of disappointment and a great waste of money.

I would agree that this is a very simplified—indeed a very superficial—summary of the published book literature on environmental planning. What I want to convey is the sheer quantity of books which might be relevant to planning, and in fact the proportion which actually contain hard information about planning is very small—in other words, despite the potential volume, as a source of information books come quite low down the scale.

The shortage of standard textbooks has already been mentioned and in fact it is sometimes said that the real textbooks of planning are the plans themselves. Basically this is true: planning in practice varies so much, because each town, each village, each county, is different and has its own particular problems, that it is virtually impossible to lay down anything more specific than generalized guidelines to meet recognizable situations and conditions, and so the plans themselves which show how the problems of a particular area have been tackled in practice are of much more interest. Development plans and studies are therefore an important source of information about planning in practice, the techniques which it employs, and the directions in which its ideas are moving.

It is possible to identify two broad categories of plan: those produced as a result of statutory obligation, and those produced outside the legal framework, largely as a result of commission. The 1947 Town and Country Planning Act laid down that every local planning authority throughout the country—counties and county boroughs in England and Wales, counties, counties of cities and large burghs in Scotland—should prepare a development plan for its area, based on a survey of its existing resources and land uses. The development plan was intended to indicate the way in which the planning authority proposed to allocate the land within its area between different uses; it also indicated the stages by which proposed development should be carried out. The development plan consists of a report of the basic survey of the area and the plan itself, and each of these two parts is made up partly of written material and partly of maps. In the case of the survey report, the written material is known as the written analysis, and in the case of the development plan it is referred to as the written statement. There is an important distinction between the report and the plan, in that the plan is a statutory document in the sense that it had to be approved by the Minister of Housing and Local Government and was then operative under the terms of the Act; but the report is simply a document prepared by the authority for the information of the Minister and has no statutory effect. Development plans of this type cover the entire country, and while they have never been generally available, they may still be consulted in the local authorities, in the appropriate central government departments, and frequently in the local public library.

The 1947 Act also specified that the development plan should be reviewed every five years by means of a fresh survey of the area which would provide the basis for any necessary amendments or alterations. Although quinquennial reviews were never produced by some authorities, in many cases the original development plan has been supplemented by a substantial quantity of additional documentation in the form of reviews, town maps, and detailed local plans. The larger counties and cities in England hold good examples of this type of supplementary material.

Over a twenty year period, while these plans were being produced and reviewed, the combination of the amount of detail required in the plan and the slowness of the central administrative machine to approve it caused the system virtually to seize up, and a radical rethinking of the process led to a new Town and Country Planning Act in 1968, which introduced a new development plan system. The detailed development plan is being replaced by a structure plan which represents no more than a 'broad brush' statement of policies; this is the part of the plan which requires ministerial approval. Within this framework, local plans are to be prepared, which will contain the detail formerly accorded to the whole areas and which will not require ministerial approval; local plans will be for areas which are in urgent need of redevelopment, usually identified as such in the structure plan, for urban parts of counties, or for town centre improvements. This structure plan concept clearly has in view its application to areas larger than the existing local government units: it is in fact a sub-regional concept, and is being phased in gradually, pending reorganization in 1974 and 1975. The 1968 structure plan is primarily a written statement of policies, which may or may not be accompanied by illustrative material, and the indications are that it will be a weighty document, perhaps accompanied by technical appendices. The first sub-regional structure plan to be published is that for the South Hampshire sub-region based on Portsmouth and Southampton, and this is the product of years of work by a team set up as an experiment in local authority co-operation under the sponsorship of the Department of the Environment.[12] Plans have also been produced by some existing local authorities such as Teesside, Brighton and Warwickshire. They will, of course, eventually cover the whole country in the same way as the 1947 plans have done.

There is an important point to be made about the informational role of these structure plan documents. In furtherance of the policy of public participation in the planning process, which is a major theme of the 1968 Act, the planning authority must, before deciding the content of its structure plan, publicize the report of the survey on which the plan is based and also the matters which it proposes to include in the plan, so that members of the public can make representations in connection with these, and in fact regulations may require the authority to put their documents and plans on sale to the public. Structure plans, in the form of draft documents for public participation, are therefore produced in quantity and are likely to circulate much more widely than their predecessors. There will thus eventually be a readily accessible source of information about the policy planning of the entire country, although that is looking rather far into the future.

In addition to this statutory source of information, there is the second category of development plans, those which have been prepared on an *ad hoc* basis outside the legal system. In the main, these are productions of the last decade: the gradual official recognition of national policy and regional planning has resulted in a substantial and often valuable literature in the form of commissioned development plans, studies and reports covering varying sizes of areal unit from the region downwards. These documents are particularly valuable when they include detailed descriptions of the methods used, of the studies carried out, or of the guidelines adopted in the solution of problems arising from different sets of circumstances. While the statutory development plans conform —must conform—to a standard form of presentation, there is no such standard for this second category, and this applies not only to its presentation. To quote from the journal *Town and Country Planning* of 1969:

> . . . one cannot observe British planning today without being impressed by the number of studies undertaken to guide future development, by the lack of coordination between these studies, both within the same region and between adjacent regions and sub-regions, and by the lack of any imperative connection between these studies' recommendations and the actual planning of local authorities.

and indeed, the situation is not unique to environmental planning, for the same lack of standards is apparent in the ten-year plans required of the local authority social services departments, and in the regional recreational surveys carried out under the aegis of the Sports Council.

The best way to categorize this literature is by the size or type of area to which it relates; regional, sub-regional, town, village, and of course parts of towns, and specialized situations like new towns. This is a safer breakdown than an attempt to categorize by the type of report. Here it is possible to identify three basic types: the survey or study, which analyses the various factors at work in an area and which makes recommendations for solving the problems involved; then there is the feasibility study, which starts from a similar analysis but predicts whether development within the area is feasible, and the most likely form it should take; and thirdly, the actual forward plan, which makes firm recommendations for development, although in recent years there has been an increasing tendency to indicate only broad strategies and to formulate goals and policies, rather than to set down specific recommendations about physical layouts. As Colin Buchanan put it some years ago:

> . . . planning is becoming less and less a matter of precise propositions committed to paper and more and more a matter of ideas and policies loosely assembled under constant review, within which, every now and then, some project is seen to be as ready for execution as human judgement can pronounce. . . .[13]

The trouble is that most of the documents within this category are an admixture of all these three things and it is usually impossible—and not particularly useful, in any case—to assign them into a pigeon hole. In the regional category, there are the various studies and plans produced by the Economic Planning Councils and these are purely advisory documents with no government commitment whatsoever. The south-east region of England is, as one might expect, the most planned part of the country, and it is possible to trace a logical progression from Abercrombie's *Greater London plan* of 1944, through the Ministry of Housing and Local Government's well-known *South East study 1961–1981* published in 1964, which was the starting point for several sub-regional studies which have resulted in such major developments as the new town of Milton Keynes and the South Hampshire structure plan; to the most recent plan, the *Strategic plan for the south east* prepared by the South East Joint Planning Team of the Department of the Environment, published in 1970. This *Strategic plan* has been formally adopted as the framework for planning in the South East region, within which local planning authorities will prepare their own development plans.[14]

In the sub-regional category, South Hampshire has been mentioned several times already and indeed it has achieved a classic status in planning. Scotland has produced some of the most distinguished plans in this category, starting with the three plans of the post-war years for the Clyde Valley, the Tay Valley, and Central and South East Scotland. The 1960s have seen the production of three major plans prepared under the aegis of the Scottish Development Department and published by HMSO: the *Lothians regional survey and plan* of 1966 and *Grangemouth/Falkirk regional survey and plan* of 1968, both prepared jointly by teams from Glasgow and Edinburgh Universities, and *The Central Borders—a plan for expansion* prepared by two departments of Edinburgh University in 1968. These plans are notable for the introduction and development of new planning techniques and also for the introduction of multi-disciplinary teams into planning, resulting in the production of plans which fuse economic, social, and physical factors into an overall conception. Another plan which is notable for its introduction of new techniques is the *Leicester and Leicestershire sub-regional planning study* published in 1969 by the city and the county councils. This is the study which first put into practice the systems view of planning, a view which sees the planning process as the application of controls to a dynamic and constantly changing social system and the end result not as a fixed plan but as a strategy which will require continuous monitoring and adaptation to accommodate change. The impetus for this study came from Richard Crossman as Minister of Housing and Local Government in 1966, and his aim was 'to persuade the authorities in a small number of selected areas to come together and set up *ad hoc* teams to prepare long-term "broad brush" plans for land uses and transportation', which were to be called sub-regional studies. The Leicestershire study has been followed by the Nottinghamshire/Derbyshire study[15] and by that for Coventry, Solihull and Warwickshire,[16] all set up with similar terms of reference and all relying heavily upon computers for systems simulation.

Many of these development plans and studies are published by HMSO, and in fact, the Stationery Office is probably the major producer of information on environmental planning in this country. Government publications are an important source for planners and here again it is possible to identify three major categories: legislation and associated publications; advisory publications of a practical nature concerned mainly with procedures and special problems; and a vast category which includes development plans and studies, and reports of surveys. Legislation is, of course, a vital part of planning information, because, however much the debate may go on about the social and economic content, the ideology and the image, planning is a process which in its day to day activities is carried on within a legal framework, and which is therefore subject to formalities of procedures. The first legislation to specifically mention planning was the Housing, Town Planning etc. Act of 1909; the first Town and Country Planning Act was passed in 1932. The 1947 Act was the major legislation which laid down the basis of modern British planning and which still operates in many parts of the country. 1968 introduced the structure plan system and the policy of encouraging public participation, and that legislation has now been consolidated in the Town and Country Planning Act of 1971 (1972 in Scotland) which is the major current statute. Most recently there has been the Town and Country Planning (Amendment) Act 1972 which applies to

England and Wales and gives neighbouring authorities the power to join together to prepare a structure plan for their joint area. There are also the statutory instruments and circulars arising from these various Acts, containing orders and regulations made under the provisions of the Acts, and explaining policy to be followed. Planning is also affected to a greater or lesser degree by a wide range of cognate legislation, such as the Transport Act of 1968, the Civic Amenities Act of 1967, the Countryside Acts, and the various Housing Acts, to name only the more important. Fortunately, there are guides to the legislation, and one of the planning 'bibles' is Sweet and Maxwell's loose-leaf *Encyclopedia of the law of town and country planning*, edited by Sir Desmond Heap, which is regularly updated by packets of amendments and additions. The *Encyclopedia* refers only to England and Wales—there is no comprehensive guide to British legislation including Scotland. Heap is also the author of the well known *Outline of planning law*,[17] now in its fifth edition, which competently reduces the mass of detail to pocket size. There is indeed no shortage of digests, guides, and annotated texts, with little to choose between them. Associated with the legislation are the various reports and white papers which have resulted in major new legislation and which set out the thinking behind the changes: one of the best of these is the report of the Planning Advisory Group on *The future of development plans*[18] which reviews the defects of the 1947 system and proposes the structure plan concept. Also of interest are the various reports on housing, both in Scotland and in England and Wales, which advocated rehabilitation instead of demolition and rehousing and which led to the Housing Act of 1969 with its introduction of the General Improvement Area, now a major item in most planning programmes.

Advisory publications issuing from government departments cover a wide range, and of particular interest to planning are those which come from the Department of the Environment on transport and traffic planning, housing, pollution, conservation, physical planning, and planning procedures; from the Department of Trade and Industry on industrial matters; and from bodies such as the Countryside Commission on countryside and recreation planning. Also in the category of government publications are the development plans which have already been mentioned; a wide range of survey reports covering broad subjects such as *Planning for leisure* (1968) or specific, such as *The holiday industry of Devon and Cornwall* (1970); an equally wide range of reports of committees, commissions, working parties, advisory groups and similar government paraphernalia, on subjects such as public participation in planning; noise; environmental pollution; management techniques; and urban motorways. It would be possible to go on much longer and in much more detail, but I hope that this sketchy summary has been sufficient to indicate the importance of government publications as a source of information on most matters central or relevant to the theme of environmental planning.

Sooner or later, in a discussion of sources of information, one comes to the journal. It has been established that the 'average planner' regularly sees six journals, and from what is known about library provision in planning offices, it is more than likely that the six journals are much the same up and down the country. The journal, in fact, is not a source of major importance to the British planner in practice, although its value rises in teaching and research. It is not too difficult to quote the titles of six journals which contain the word planning—the *Journal of the Royal Town Planning Institute, Planning Outlook, Town and Country Planning, Town Planning Review, Planning Bulletin,* the *Journal of Planning and Environment Law,* will do for a start without going beyond the shores of the British Isles. Problems arise when other words are brought in. To add 'urban', 'regional' and 'environment', for example, expands the list many times: titles such as *Urban Studies, Regional Studies* and *Environment and Behaviour* come in, and these are all useful sources of information, although on an academic rather than a practical level. But the real problem is that information on planning, in all its aspects, is to be found in the journals of so many other subject fields, not all of them obviously related—transport, economics, sociology, housing, and geography make obvious contributions, but relevant articles can also be located from time to time in journals which are devoted primarily to subjects such as medicine, public health, agriculture, climatology, photogrammetry, and so on.

In a recent citation analysis study which formed part of our research project in Edinburgh,[19] we analysed citation data from articles relevant to British planning in forty-two British and American journals covering a wide range of subjects, and we produced a list of 203 journal titles which were cited two or more times. When this list is ranked by the number of citations received by each title, it turns out that the top ten journals cover planning, regional science, geography, sociology, and economics; and that the 'tail' of journals cited only twice each numbers seventy-five and includes titles such as the *Christian Science Monitor, Arctic and Alpine Research,* the *Journal of the British Waterworks Association, Public Administration Review,* and even *College and Research Libraries.* The point about all this is that, while the titles which figure at the top of the list—those forty-three which are cited ten or more times—are clearly relevant in whole or in part to planning and would be likely to recur, though perhaps in a different rank order, no matter what source journals or source year was taken for a citation analysis study, some at least of the 160 titles which are cited nine times or less, may well be freaks, particularly those with only two or three citations. A citation analysis study carried out every year would in all probability produce a different set of peripheral journals each time. Therefore, in any discussion of the journal literature of planning, it is advisable not to be dogmatic; it is safe only to say that there are about fifty journals which regularly carry articles which are relevant to planning, and in addition to this, there is a fluctuating periphery which probably changes from year to year as subjects and titles come and go, which is worth investigating if time permits.

One thing which has become apparent in the course of citation studies is the dichotomy between the academic type journals which form the citation network and the news-type journals which do not cite, and which are not cited by, other journals. This split is by no means unique to planning: it is common throughout the social sciences generally. There are in fact a number of weekly journals which regularly carry news items and sometimes articles about planning matters. Again these are mainly journals which are primarily concerned with related subjects. Examples are *The Surveyor, New Society, Estates Gazette, Architects'*

Journal, and the *Economist*. It seems that this type of journal is probably used for quite different purposes than is the academic counterpart, perhaps by different types of planners. One of the great information needs in planning is for systematic current awareness of planning in practice, and this gap is by no means satisfactorily filled by the various weeklies at present available, since these in the main tend to cover the same key issues like the Greater London Development Plan or the transport problems of Bath. As another part of our research project in Edinburgh, we are shortly going to embark upon a comparative assessment of about twenty weeklies of this type, with a view to examining the degree of overlap, and such factors as time lag, coverage of key topics, and so on. It may not be possible to achieve any degree of rationalization between the journals concerned, since each one has its own editorial policy to follow, but it should at least be possible to identify those which offer the most consistent coverage of planning topics, and to identify significant gaps.

I have mentioned our research project several times in the course of this paper, and perhaps I may conclude with a very brief outline of the work which we are doing at the Planning Research Unit of Edinburgh University. Basically, we are concerned with information for all planning activities—practice, teaching, and research, in all types of organization. We are concerned with finding out more about the information base of planning—what it is made up of, its structure, its subject linkages, where it comes from, what form it is in, and so on. Towards this end, we have completed citation analysis studies using citations taken from the published journal literature, and we are currently near to completing an intensive exploratory study of unpublished and semipublished information. In the summer we shall begin the examination of news-type journals relevant to planning. We are concerned also with developing and testing methods of organizing planning information, and methods of packaging and presenting it for dissemination to planners. To the first end, development of a linked classification and thesaurus began in January 1973, and we hope that the scheme eventually evolved will be capable of application to any situation, from the small library to the national computer-based information service of the future. To the second end, we shall begin to operate, in autumn 1973, an experimental information service which will be sent to a sample of about three hundred planners throughout the country to obtain feedback on various factors such as frequency, contents and relevance. The project began in April 1971, and will end in June 1974, and we hope by then to be able to draw all the various strands together and to be able to say to planners, in effect: this is your information, this is what to do with it.

Planning information is an area which is never static, and there are several factors which must influence its provision in the future—not the least of these is the approaching fact of local government reorganization and the strong possibility that the boundaries between departmental information bases will fall to allow council-wide information services to come into being. An important factor also is public participation in planning, and consideration will have to be given to the degree of access which members of the public will be permitted to planning information services; this in turn must influence the organization of such services, and must equally necessitate a re-definition of the concept of confidentiality. These, and other elements, mean that any research which is being done at the present time must be flexible in its conclusions and open to the parallel information problems of areas, such as the reorganizing National Health Service and the new social services and social work departments. It is an area which is full of interest, and full of stimulus, and I hope that this discussion of some of its sources of information, and the problems attaching to them, has served to demonstrate a little of these qualities.

NOTES AND REFERENCES

1 DEPARTMENT OF THE ENVIRONMENT. *New roads in towns: report of the Urban Motorways Committee.* London: HMSO, 1972.

2 DEPARTMENT OF THE ENVIRONMENT. *Development and compensation: putting people first.* Cmnd 5124. London: HMSO, 1972.

3 Since giving this paper, I have been given to understand that a draft third edition is in existence, which may be published by the United Nations; total reliance should not, however, be placed upon this item of news.

4 London: Estates Gazette, 1969.

5 Washington: International City Managers' Association, 4th edition, 1968.

6 This remains to be proved, since the first volume, announced for January, did not appear until 26th April.

7 London: Collier-Macmillan, 1964–72.

8 Edinburgh: Edinburgh UP, 1966.

9 London: Barrie & Jenkins, 2nd edition, 1970.

10 London: Allen & Unwin, 1972.

11 London: Tavistock Publications, 1969.

12 SOUTH HAMPSHIRE PLAN ADVISORY COMMITTEE. *Structure plan for the south east part of the county of Hampshire (Consultation draft published in accordance with Section 8 of the Town and Country Planning Act, 1971).* Winchester: Advisory Committee, 1972.

13 MINISTRY OF HOUSING AND LOCAL GOVERNMENT. *South Hampshire study; report on the feasibility of major urban growth.* London: HMSO, 1966, 2 volumes. The quotation is taken from the main volume.

14 All of these published by HMSO.

15 *Nottinghamshire and Derbyshire sub-regional study.* Nottingham: Notts. County Council, 1969.

16 *Coventry—Solihull—Warwickshire—a strategy for the sub-region.* Coventry: City Council, 1971.

17 London: Sweet & Maxwell, 1969. A sixth edition was published June 1973.

18 London: HMSO, 1965.

19 Research project financed by OSTI and based on the Planning Research Unit of Edinburgh University. A short Interim Report, produced for publicity purposes in April 1973, is available on receipt of a stamped, addressed, foolscap-size envelope from the author, at the Unit, 57 George Square, Edinburgh EH8 9JU.

Sources of Information on Environmental Pollution

Nigel Harvey

Agricultural Research Council; formerly Technical Information Officer, Central Unit on Pollution, Department of the Environment

Paper presented at an Aslib Scottish Branch Conference, Glasgow, 23rd March 1973

1. Introduction

ENVIRONMENTAL pollution is defined, essentially, as the discharge by human action into the environment of something undesirable, for example, a gas, a chemical, oil, a noise. So the phrase 'environmental pollution' covers an immense variety of types of pollutant, an immense variety of types of environment polluted, an immense variety of consequences, and an immense variety of methods of investigation, monitoring and control. The subject is vast, fragmented, incoherent and expanding. So is its literature.

There are in the English-speaking world more than forty abstract series and more than a hundred and fifty journals which include material on pollution. Some deal with all forms of pollution, some only with particular forms of it. Some are solely concerned with pollution, others include pollution material with material on other topics. But all, in one degree or another, are relevant.

There is, apparently, no general classification on this subject. In practice, it is generally classified in terms of air pollution, soil pollution, freshwater pollution, marine pollution, noise and radio-activity with appropriate sub-divisions. This form of classification is admittedly crude and it can cause difficulties when dealing, for example, with heavy metals which are found in many environments. It is also illogical, since its headings include both elements polluted and the means whereby they are polluted. But it is satisfactory for most practical purposes, since these are the terms in which legislators, administrators, industrialists and scientists tend to work.

For immediate purposes, however, it is preferable to regard environmental pollution as a single subject. It will be appreciated, of course, that this survey of the sources of information on such a subject is necessarily in very general terms and that the particular sources mentioned are no more than examples of the class of literature under discussion.

2. Abstract series

These are of two main types, the specialist and the general.

Examples of the former are the *Air Pollution Abstracts* and the *Water Pollution Abstracts*. Examples of the latter are the American *Pollution Abstracts*, a good comprehensive source, and *LOGA*, the Local Government Annotation Service, which presents material of interest to the Local Authorities who are responsible for so much of the day-to-day control of pollution.

3. Journals

The number of these is considerable and increasing. Indeed, the publication of environmental journals is now a recognized growth industry. Some twenty UK journals in this field have appeared since 1970. It is important to scan publishers announcements to keep lists of journals up-to-date.

Journals fall into the following main classes:

General, popular

Nature and the *New Scientist* are basic general sources. The more specialized *Ecologist* and *Your Environment* include current news and views in more popular form. The newsletter *Pollution* covers 'pollution, planning, products, politics and publications'.

An admirable example of popular science in this field at its best is the American *Environment*; as, indeed, it should be, with three Nobel prize-winners on its editorial board. All its papers are well referenced.

Technical, professional

Examples of these are:

Effluent Water Treatment Journal. General news and technical papers.

Environmental Health, issued by the Association of Public Health Inspectors.

Environmental Planning and Pollution Control and *Environmental Pollution Management* aimed at industrial and official readers.

Industrial Recovery, aimed at commercial readers interested in recycling.

Municipal Review, which includes sections on environmental health, news and equipment.

Noise Control and Vibration Reduction, technical development and commercial news.

Water Treatment and Examination, issued by the Society of Water Treatment and Examination.

Scientific and research journals

Examples of these are:

Atmospheric Environment. International research journal on air pollution.

Biological Conservation. Comprehensive, with a worldwide news survey section.

Environmental Pollution. Research papers, mainly concerned with biological effects of pollution and their control.

Marine Pollution Bulletin. Good scientific and technical coverage, including a current awareness service.

4. Handbooks

Handbooks and periodical reference books are frequently useful sources. Examples are:

Clay's Public Health Inspector's Handbook. This covers the legal and technical side of pollution control by Local Authorities.

Materials Reclamation and Buyers' Guide.

Municipal Buyers' Guide. Lists commercially available equipment for pollution control.

Pollution Control Yearbook. To be published this summer.

5. Sources of information

So far we have considered publications without particular reference to their origins. But, at the risk of some slight duplication, it is useful to consider the main centres and bodies which breed, store and issue relevant material. These fall into the following main classes:

Laboratories

These, of course, issue reports on particular projects and annual reports, but a number also issue more general material. For example:

Building Research Establishment. *Building Abstracts,* including sections on noise and on waste disposal.

Marine Biological Association Laboratory, Plymouth. Includes the Marine Pollution Documentation and Information Centre sponsored by Natural Environment Research Council.

Monks Wood Experimental Station. Very readable biennial report, a good source on pesticides.

UK Atomic Energy Authority. List of publications available to the public.

Warren Spring Laboratory. *Air Pollution Abstracts. Annual Report* covers recycling as well as air pollution.

Water Pollution Research Laboratory. *Water Pollution Abstracts. Monthly Notes on Water Pollution.*

Government Departments

The most relevant are:

Agricultural Research Council.
Department of Agriculture and Fisheries for Scotland.
Department of Health and Social Security.
Department of the Environment.
Department of Trade and Industry.
Ministry of Agriculture, Fisheries and Food.
Medical Research Council.
Natural Environment Research Council, which includes the recently-formed Institute for Terrestial Ecology.
Scottish Development Department.

The importance of the libraries of these Departments is obvious. So is the importance of Departmental publications, notably Departmental annual reports and the reports of such specialized services as the report of the Chief Medical Officer (DHSS), of the Chief Alkali Inspector (DOE) and of the Laboratory of the Government Chemist (DTI).

Government reports, such as the Summer Report on *Refuse Disposal,* 1970, are peculiarly valuable, since they contain reviews of information and lists of interested bodies from which they have received evidence as well as recommendations on future policy.

A major official source is the Royal Commission on Environmental Pollution, which advises the Government 'on matters, both national and international, concerning the pollution of the environment, the adequacy of research in this field and future possible dangers to the environment'. Its reports are authoritative and well documented.

Its opposite number in the USA is the Council on Environmental Quality. The *Annual Report* of this council is broader and more 'popular' than the Commission's publications, but provides a well documented and well presented commentary on current problems and their control.

Official publications appear in the HMSO Sectional Lists. HMSO has also issued *A selection of titles on pollution and the environment.*

A useful reference publication is the mimeo *Index of current Government and Government-supported research in environmental pollution in Great Britain, 1972,* issued by the Central Unit on Environmental Pollution, Department of the Environment. This includes the addresses of all relevant research stations and the Government Departments responsible for them.

Private bodies

These are very numerous and very varied. Many issue annual reports, some issue journals, some issue *ad hoc* reports from time to time.

Examples are:

Anglers' Cooperative Society.
Clean Air Society.
Coenco (Committee for Environmental Conservation, an 'umbrella' body).
Institution of Public Health Engineers.
Institution of Water Engineers.
Noise Abatement Society.
Royal Sanitary Association of Scotland.
Royal Society of Health.
Scottish Marine Biological Association.
Society for the Protection of Rural England.
Society for the Protection of Rural Scotland.
Society of Chemical Industry.

International organizations

A number of official international bodies are concerned in various ways, notably UNO, which was responsible for the 1972 Stockholm Conference, and its FAO and WHO agencies, also OECD and NATO. The publication lists of these give guidance on the considerable body of literature they issue. The publications of the International Atomic Energy Agency are a standard source on radioactive pollution.

An important private body is Stichting Concawe in Holland. This is the documentation centre of the oil companies and issues very useful literature in English on the various forms of pollution by oil.

6. Reviews of literature

This term is used to include not only the formal reviews of literature in scientific journals, but also less formal digests, summaries and state-of-the-art papers, indeed, any publication of this sort which quotes the sources from which it is compiled. One major source of such papers are the reports of conferences, especially of professional bodies.

The annual reviews, *Advances in ecological research, Advances in the environmental sciences* and *Advances in pest control* are invaluable sources within their terms of reference. A particularly welcome publication is the American quarterly, *Critical reviews in environmental control,* which consists entirely of authoritative reviews of literature.

7. Guides to sources

Fortunately there are several good guides to this huge and expanding mass of material. As follows:

1. A series of bibliographies on the various types of environmental pollution issued by the Library of the Department of the Environment. These include one on sources of information, with useful addresses.
2. A similar series by the British Library, Science Reference Library.
3. G. D. CUZNER, *Pollution. A select bibliography.* Manchester City Library. 37 pp. 1972.
4. *Pollution. Sources of information.* 1972. 102 pp. Full report on Aslib and Library Association Conference held in 1971, which covered all forms of pollution. It gives details of all publications mentioned and an index to relevant organizations, authorities and institutions.
5. *Environmental pollution: a guide to recent publications,* by N. Lee and P. J. W. Saunders of the Pollution Research Unit of Manchester University, in *British Book News,* March 1973, pp. 140–49. An admirable and comprehensive review, including a final section on abstract series and documentation centres where further references can be found.

8. Books

This list of guides to the literature will explain, perhaps rather belatedly, the absence of any reference to books. There are, of course, numerous, indeed innumerable, books on this subject, ranging from formal, specialized textbooks to ephemeral treatises of the type nicely described by Mrs White as 'speculative'. Most of them, however, have one characteristic in common. They get out-of-date quickly. So it is not really practicable to attempt any list of books in a talk of this kind; the best sources here are the most recent issues of the bibliographies mentioned in the previous section.

The Scope for Operational Research in the Library and Information Field

Martin Elton

Communications Studies Group,
Joint Unit for Planning Research, University College,
London

Brian Vickery

Assistant Director (Research), Aslib

Introduction

OPERATIONAL RESEARCH was born during the 1939–45 war as an aid to military decision making. After the war it was rapidly applied to industrial production, and many new techniques were developed. It has since spread to all spheres of policy making.

'OR', as it is frequently called, is not wholly new to the information field, as can be seen from the survey prepared by Mackenzie and Buckland.[1] But a wide ranging review of its potentialities has been needed. In the Autumn of 1971, at the suggestion and with the financial support of the UK Office for Scientific and Technical Information, Aslib commissioned the Institute for Operational Research (IOR) to make such a review. A series of reports was prepared by Dr Elton (then of IOR) and D. W. Millen, for discussion by Aslib and OSTI. At the end of the contract, B. C. Vickery prepared a report for OSTI, summarizing the reactions of Aslib Research and Development Department to the enterprise.

The present paper interweaves the views and ideas of both sides of the dialogue, so as to present to a wider audience some account of the scope for OR in the field of library and information service (sometimes called 'our field' in the ensuing remarks).

The nature of operational research

Throughout the project, the Institute for Operational Research laid stress on its views of OR as being more than a set of techniques for investigating organizational and operational problems: OR is an organic problem-solving activity which is capable of developing new techniques as situations demand. It is applicable not only to the routine problems of organization, but also to strategic planning and to problems of design.

OR may be contrasted with the more familiar activity of 'system development'. A recent attempt to summarize Aslib experience in this field is structured as follows:[2]

Communicating specialist information
Systems and their investigation
The user environment

Components of information systems
The analysis of processes
Conceptual and mathematical models
The design of systems
Evaluating information systems

The dividing line between good systems analysis and good OR is very ill-defined in practice, but it is helpful to identify the nature of the dividing line. To describe what is distinctive about OR is complicated because it shares with systems analysis an emphasis on considering 'total systems'; it shares with the best of other management research activities an emphasis on defining objectives; it borrows freely from and contributes to applied mathematical and statistical theory; it often makes use of data supplied by O & M or Market Research studies; it may draw on the theory or results of behavioural science and computer science. Any distinctiveness is also partly a matter of style—perhaps an emphasis on clear statements of objectives and on implementing and controlling solutions; and of knowledge—experience of solving problems in various settings and knowledge of techniques which have proved useful in them.

However, the three essential characteristics of OR may be set out as follows:

(i) it is a problem-solving activity;
(ii) it proceeds using the scientific method—that is, the formulation, testing and refinement of models of reality;
(iii) it uses such models to estimate consequences of alternative courses of action towards some end, so that the one with the most preferred consequences can be identified and implemented.

The key emphasis is on the construction, testing and manipulation of symbolic models to aid decision-making. It is clear from the synopsis of the 'system development' approach that models also play their part in it—indeed, inevitably so, because models are essential tools to explore particular aspects of actuality. Chapanis[3] has defined models as analogies, being 'representations or likenesses of certain aspects of complex events, structures or systems'—simplified representations of certain aspects of actuality. Models used in systems development include diagrams of spatial layouts, sequential models such as flow charts, structural models such as communication nets, hierarchies such as organization charts, logical models such as Venn diagrams, mathematical models such as that of Bradford-Zipf, covariance and probability models.

Nevertheless, it is true (at any rate, of Aslib experience) that systems analysis tends to use models in a static way—to represent, in skeletal form, certain characteristics of an existing or notional process, structure or system, but purely descriptively (see, for example, Pauline Thomas on a procedural model for the use of bibliographic records in libraries[4]). Quantitative models have been used (for example, in the study of standard times in library processing, by Wilkin, Reynolds and Robertson[5]) but designed only for statistical manipulation to elucidate relations between variables.

On the other hand, the OR approach involves a more dynamic, experimental manipulation of models. The essence of an OR project may be described as: (1)

development and testing of explicit models of systems in which problems arise, and of explicit criteria by which courses of action should be evaluated; (2) extraction of optimal solutions by mathematical analysis or other means; (3) ideally, the OR team will be involved in any implementation and monitoring of change following its recommendations.

Models contribute to decision-making by helping to overcome problems of uncertainty and complexity. Uncertainty problems occur in situations where the relation between system performance and system variables is imperfectly understood—one must concentrate upon constructing a valid model and testing it. Problems of complexity occur when either there is too wide a range of options or there are two many constraints upon the controlling variables (in which case techniques such as linear programming or computer simulation may be needed).

An uncertainty perspective will lead to greater emphasis on model formulation and validation, a complexity one to extracting solutions. It is easier to generalize about solving models and so the literature of OR is heavily biased towards solving rather than constructing models. Nevertheless, when dealing with social systems (and communication is a social function) an uncertainty perspective has generally proved the more successful. For such systems, making objectives explicit, deriving suitable measures of the extent of meeting them, developing simple quantitative relations between input and output, and identifying constraints that one should pay to remove, have proved considerably more valuable than the mere manipulation of complicated mathematical models.

It is important to stress this point. Casual examination of the literature of OR may lead one to see in it primarily a set of sophisticated analytical techniques, whose significance for our field of work seems to be limited because (a) many of the classic models represented situations that did not seem to be common in the information field, and (b) even with apparently relevant models the effort of data collection and manipulation seemed much greater than the benefits to be expected.

The emphasis on the structuring of problems, and the formulation of relevant models, is very much in line with previous Aslib thinking (see, for example, not only the work of Pauline Thomas, but also the article by Martyn and Vickery on the complexity of information systems modelling[6]). What needs to be grasped is a new emphasis on the testing, refinement and manipulation of quantitative models to provide aids to decision. This is taken to be the essential nature and contribution of OR.

The formulation of models

A model, in its most general terms may be represented as

$$P = f(c,u)$$

The performance (P) of a system, relative to its objectives, is a function of its variable attributes—both those under the control of the decision maker (c), and those not under his control (u). Manipulating the model is a matter of demonstrating how P will change as c is altered and as u changes. To give a simple example, P may be 'percentage of loan requests satisfied', u may be 'daily volume of loan requests' and c may be 'length of loan period'. (Here we are assuming that the volume of loan requests is not under the control of the decision-maker: in certain situations it may be.) To formulate a model it is necessary (i) to identify the relevant variables c and u, and the range of values that each can take, (ii) to construct a valid operational measure P, and (iii) to determine the form of the function (f).

The variables c and u can be attributes of a particular system, of a particular configuration of components, and the model then seeks to explore how to optimize the performance of this system. Alternatively, c and u can be attributes of 'decision areas'—aspects of a notional system, for each of which there may exist a number of alternative 'options' in choice of component—and the aim is to seek a set of options, a configuration, that will give optimal performance.

Identifying such variables—of both kinds—is a typical task in systems analysis and design. An example of Aslib modelling for a particular system has already been cited (the work on standard times in library processing). It should be noted however that the identified variables in this case—for example, availability of author abstract, language of article—were treated as uncontrollable, so that the model could not demonstrate what controllable changes might be made to improve processing performance (i.e. reduce time). The examination of options in system design is a task that occurs in many information system development projects, but it is fair to say that there is rarely used an explicit modelling approach with explicit performance criteria.

Whereas the first example in the last paragraph illustrates a static, descriptive approach to modelling, the system design work highlights a major weakness in the information field—the sparse use of performance measures as an aid to decision making. Much time and thought needs to be devoted to such measures, as an essential step in the modelling process.

Measures of performance

A performance measure provides a quantitative assessment of how good is the output of a system with respect to some criterion. The crucial outputs are services provided to system users—e.g., document delivery. Intermediate outputs are those of processes that contribute to a user service—e.g., document acquisition. One may also measure the performance of management activities that contribute to system operation—e.g., recruitment of staff. It is important that intermediate measures should be defined in a way that reflects their relevance to overall system performance.

Measures are tools—there is little value in developing them if they will not be used. Current use of measures is sparse. Is this because the tools are inadequate, unwieldy or expensive? Or because they have not been tried yet? If the latter, is it simply because there has not been enough time? Or because there is a lack of awareness or motivation on the part of those who might use them? Or because of a lack of models for predicting effectiveness as a function of the alternative decisions open to the manager? Or because the potential users of these tools do not know how to put cost and effectiveness measures together for decision-making purposes?

There is certainly a need in the information profession for more objective measures of performance—even if only to be used defensively to demonstrate to system funders that a good job is being done. There is a widespread feeling of uncertainty as to what to measure and how to measure. Our view is that the situation is unsatisfactory. Some measures have been widely publicized in the special library field—e.g., recall and precision in the retrieval process—but there is a feeling (justified or not) that these measures are costly to use and of only limited significance. Such feelings to some extent spring from inertia—a lack of motivation strong enough to lead to trying out the measures. By and large, libraries and information services measure only what can be recorded easily, e.g. statistics of acquisitions, loans made, enquiries received, and do not try to devise measures clearly related to a user service.

There is also considerable lack of clarity about the nature of performance measures—even among those in the R & D side of information work, and even in a specifically prepared 'review of criteria used to measure library effectiveness',[7] which is a very confusing presentation. There is no clear analysis of the form: what are the objectives of an information system? How does each offered service relate to these objectives? What characteristics of a service are of importance in assessing how well objectives have been met? What measures can be used for a particular characteristic? What procedures can be adopted to make a particular kind of measurement? Measures are rarely considered in an overall context:

(i) definition of the measure and its scale, which involves developing an operational definition of relevant objectives;
(ii) development of instruments for obtaining measurements on the scale chosen;
(iii) development of models for predicting what values of the measure would result in particular circumstances;
(iv) development of models in which the measures can be used as an aid to decision-making and control.

Once again, we consider that the sparse use of models for prediction or control means that the full potentialities of performance measurement are not realized by information system managers. As far as control is concerned, the use of regular, routine measurement of performance has been rare in libraries and information services. As for predictive use, possible approaches, such as the following, have quite evidently been but little used:

(i) analysis of cross-sectional (contemporaneous) or longitudinal (historical) comparative data, in which the measures of effectiveness are taken as dependent variables to be explained in terms of independent variables by one of a variety of techniques—curve fitting, regression and so on;
(ii) construction of other mathematical models;
(iii) construction of computer simulation models;
(iv) planned experiments using relevant statistical theory;
(v) subjective estimation (we do not consider this method to be a poor relation).

Other questions that we have asked earlier are also relevant in explaining the sparse use of measures. Some of those proposed have indeed been unwieldy and expensive to use, and there is a need to develop approximate but more easily derived measures that can be related to those that are more sophisticated and soundly based.

Lastly, it is undoubtedly true that the information profession—even its R & D wing—has barely begun to approach the problem of relating cost and effectiveness. The phrase 'cost-effective' is now much bandied about, but it is very difficult to find any studies in which the two variables have been measured in a series of changing circumstances, so that a curve or family of curves can be produced. (Current work by John Martyn of Aslib on searching large reference files is in this area, as well as work published by Orr and Schless.[8])

In discussing the need for further study of effectiveness measures, we may sum up the situation as follows: the real difficulties concern, firstly, developing measures which are both realistic in terms of objectives and practical and, secondly, persuading people to use them. To allocate priorities in this area it is necessary to know what decisions could be taken or influenced by those who manage or plan libraries and information services that might lead to improvements in terms of those organizations' objectives. It is then necessary to know how well the available measures of effectiveness could be used for showing when managerial intervention is necessary and for discriminating between alternative courses of action. In the light of such knowledge one would be able to see what improvements in existing measures should be sought and where new ones should be developed.

Type and focus of OR projects

In their project papers the Institute discussed OR projects from two broad points of view—the type of investigation carried out, and its focus (the field of application).

The latter is essentially concerned with the level of study in the library and information system. Each library is in itself a hierarchical system of activities, from 'tasks' at the lowest level to the library as a whole. It may exist within a parent organization, and be studied as one part of information provision within that wider system. It may be one of a network of co-operating libraries, or a branch in a decentralized system, and this larger network or system may be the focus of study. Still wider, there are the complexes of libraries in a geographical or subject area, the national system, or international networks.

R & D in our field has always, and inevitably, been concerned with all levels of the library and information system—ranging from particular subsystems within an individual library up to international links between major information services. Future investigations will continue to range widely, and the resulting awareness of the interaction of problems at all levels is, we believe, of great importance in achieving a balanced perspective on developments at any one level.

What should be the prime focus or field of application for OR? The question is somewhat artificial in that in a project seemingly concerned with a specific library one may have to take into account its interactions with other libraries, and in a project seemingly concerned with a system of libraries it may turn out to be necessary to use models of the individual libraries it comprises. Nevertheless the initial problem focus has to be chosen, so the matter cannot be dismissed. In this respect it is not too important where one starts but if possible allowance should initially be made for extending the subject of the study to the wider system or to more detailed examination of the component systems as the study progresses. Ideally one would attempt to initiate complementary projects, the one on a wider system and the other on a component of it.

The main advantage of working in an individual library may be that it will prove easier to identify the objectives and easier to achieve a balance between them. The main advantage of focusing on the wider system may be the lessening of the risk of sub-optimization. In any case if OR is proved to be of value and becomes more widespread in the area, both research streams can be expected and will complement one another.

Coming now to types of OR investigation, we may distinguish between practical problem-solving, enabling research, and theoretical research. The first type is readily understood—it is the use of OR to tackle the specific problems of a particular information system, at whatever level.

'Enabling' research is not necessarily or indeed usually directed at the needs of a particular system, though it may be so. Its aim is to aid practical problem-solving, by removing probable stumbling blocks which would otherwise divert too much effort in solving particular problems. It is investigation that enables teams working on specific problems to overcome difficulties arising in the former—which would otherwise remain untackled because of time and financial constraints on the practical projects. Enabling research may provide conceptual models, measurable criteria, measuring instruments, adequate data, knowledge of user behaviour, etc. It is the kind of work that has elsewhere been called 'background research', regarded as the 'research' wing supporting 'development' in the R & D effort.

What has been labelled 'theoretical' research is one possible form of enabling work. It is the provision of models and solutions for a *class* of problems, without specific investigation of the particular systems in which they arise. For example, a general model may be constructed on the basis of existing theory (e.g., the Bradford-Zipf distribution) using parameters whose values must be measured in a particular system before the results can be applied.

Although there is value in the construction of some general models—e.g., a stock allocation model—experience in other fields suggests that they are unlikely to have a significant contribution to make in our field at present. The main point appears to be this: all models are inherently simplifications of actuality, but general models—in environments as complex as information systems—are likely to be oversimplifications, making too many simplifying assumptions, disregarding too many factors that must be taken into account in particular situations. Alternatively, if the model tries to incorporate all the special factors likely to be encountered, it becomes too complex to handle. Consequently, effort devoted to constructing general models may well be wasted because they are inapplicable.

Areas of investigation

We now present a tabulation of some practical problems and some themes for enabling research where OR may play a part, and comments on some of these will follow.

I. PRACTICAL PROBLEMS AMENABLE TO OR

Recurrent problems
Resource allocation
Long term planning
Advertising library services
Marketing information services

One-off decisions
Library location
Investment in new facilities

Control systems design
Policies for acquisition of stock (including duplication)
Loan policy
Decision rules for interborrowing
Weeding policy
Manpower and career planning

Other design problems
Information service design
Management information systems for libraries

II. THEMES FOR ENABLING RESEARCH

A. *Towards developing management skills*
Management gaming
Developing diagnostic tools

B. *Towards improving the effectiveness of management research*
Questionnaire design, developing other measuring instruments, data banks

C. *Towards A and B*
Developing measures of effectiveness
The metasystem (especially user behaviour)

With regard to the practical problems, as explained above we do not advocate that 'theoretical' solutions be attempted. It is preferable that a few of the organizations, where pressure for action on such problems is felt, should be able to call in OR expertise. As for enabling research, it will be necessary to consider the likelihood of obtaining usable output. This will depend not only on the difficulty of the research but also on the relevance of the output to the problems of managing libraries and information services.

(*a*) *Resource allocation.* In order to allocate the resources at his disposal to best advantage the librarian needs to know how the effectiveness of the services he offers (and could offer) depends on the way he deploys his resources, so that he may have a basis for maximizing effectiveness. The OR approach to these problems is to construct a model representing effectiveness as a mathematical function of the levels of different inputs (e.g., numbers of people in different jobs, acquisitions of different types, physical resources). The model would have to incorporate relevant constraints: maybe the librarian does not have the freedom to decide to spend less on acquisitions, more on staff.

Difficulties do not arise in extracting optimal solutions from such models (the techniques are well established), but in constructing the models. Are outputs directly proportional to inputs, as is assumed in the linear programming models so often used in other fields? What is the relation between the two? What are the relative values of the different services provided? To what level of detail need one go? Can one consider resource allocation independently of specific policies, say, loan policy?

(*b*) *Long term planning.* Resource allocation problems are generally concerned with up to one and a half years ahead in the field of libraries and information services. The longer term almost certainly offers both greater freedom of action and greater uncertainty. Should one consider building up a new service or opening a new branch? What should one be doing in the way of recruitment, training and other means to develop the library's human resources? One might attempt to identify a scenario, a pattern of the future, at which one will aim; if so, it may provide constraints on the allocation of resources meanwhile.

It is difficult to generalize about this range of problems. In other fields OR has made a significant contribution to long range planning and it is likely to have one to make in our field as well.

(*c*) *Advertising library services.* It would seem to be generally accepted that actual and potential users are often too ignorant both of the range of services provided and of how to make use of them. This may be a problem in universities and polytechnics where a high proportion of the user population is replaced every three or so years, but is also true of groups such as engineers. How should services be brought to the attention of potential users? If it is thought that there is a real problem here it would seem that the answer would lie in obtaining empirical evidence by controlled experiments in which a group of libraries participated.

(*d*) *Marketing information services.* The problems that arise in designing commercial information services, in deciding the range of packages in which they will be marketed, in pricing and promoting them, are complex indeed. Even when most of the information at one's disposal is in the form of subjective probabilities, it is almost impossible to make best use of it without constructing mathematical models. OR has made a significant contribution to resolving such problems in other fields; the most useful models have generally been relatively simple.

(*e*) *Library location.* In location problems it is usually necessary to strike a balance between accessibility and cost. Plentiful mathematical methods exist for identifying the optimal locations once the trade-off between these two criteria has been decided. The main sources of difficulties lie in relating cost to size and in taking the need for future change into account when discriminating between possible solutions.

Library location problems seem most likely to occur when new towns are planned and when urban areas are extensively redeveloped. They may also arise in the form of deciding whether to open a new branch of an existing library system. Similar problems may also occur following mergers between organizations with in-house libraries. The question of designing a suitable management system for a spatially decentralized library system should probably not be considered independently of location decisions.

(*f*) *Investment in new facilities.* Standard approaches to using mathematical models for simple investment decisions are well established. If the problem is one of choosing the most economical way of achieving a certain objective, one may compare the alternatives by using one of the discounted cash flow techniques. In other situations it may be necessary to use a cost-benefit approach (for a straightforward example see the account of the bindery problem at Lancaster University Library[9]).

(*g*) *Policies for acquisition of stock.* In comparing alternative policies for acquisition of stock (including duplication) one needs to know the implications of each in terms of the library's usefulness to its users. Two main sources of uncertainty are present. First is the relationship between policies and the measures of the effectiveness of each service which depends on the document stock. Second is the relative importance to be ascribed to each service for each class of user. By reducing the level of the first of these uncertainties, formal models will allow the librarian to concentrate his attention upon the value judgements which will still be necessary for the second type.

Document delivery is generally the most important service dependent on document stock and Orr's Document Delivery Test provides a suitable measure.[10]

(*h*) *Loan policy.* The approach to choosing between loan policies is much the same as the previous approach. The University of Lancaster Library research team constructed a simulation model to predict the effects of alternative loan policies.[11]

(*i*) *Manpower and career planning.* For large library systems one should consider constructing models which will permit comparisons of skills necessary in the future with predictions of the skills that will be available, so as to allow informed decisions on staff development and recruitment.

An aspect of such problems, on which there has recently been fruitful collaboration between OR and the social sciences, has concerned eliciting information from individuals about their expectations and perceptions of what jobs they should be doing next, which can be used in mathematical models for guiding transfer and promotion decisions.

(*j*) *Information service design.* In common with similar problems in other fields, the design of information systems often involves both the choosing of one option for each of a number of interacting components, and then the evaluation of a large number of alternative feasible combinations. Straightforward procedures have been developed whereby computers are used to sort through the combinations of options, rejecting those that are unfeasible or unattractive in terms of quantifiable criteria. This can be valuable in allowing the designer to concentrate his attention on evaluation aspects where, generally, subjective judgement is essential.

(*k*) *Management information systems for libraries.* The purpose of a management information system is to make available to management the information necessary for control and decision-making. A great deal of data can be available in libraries as a by-product of all the recording that is undertaken. It is particularly tempting when procedures are computerized to make summary statistics available as a management information system. Preliminary mathematical and statistical work is essential in these cases. It is too easy for an inaccurate impression to be formed if allowance is not made for the fact that, say, demand is not fully represented by issues, or if one does not know the extent to which fluctuations in a particular measure may be the result of purely random effects. The values of information to particular decisions that may have to be taken in the future is best assessed in terms of a model of the relevant problem.

(*l*) *Management gaming.* One of the most common uses of a management game is as a means of developing staff's ability to take decisions. Players, often in teams, decide upon the decisions they would make in a hypothetical situation. The resulting performance of the system they are controlling is then predicted by a model manipulated on a computer. If remote terminals are used it is possible for a succession of decisions (i.e. plays) to be made in a short time, the state of the system at any stage depending on the prior plays.[12]

The value of such exercises naturally depends upon the validity of the computerized model (and of the outcome measures used). If the model were sufficiently simple to take the form of a mathematical equation, decision-makers would probably be able to learn adequately from a graph. More complex situations require simulation models.

Management games can also be used as research tools. For example, a game in which players took the parts of decision-makers in a managerially decentralized system, could allow one to investigate the consequences of different management structures.

(*m*) *Diagnostic tools.* It is a commonplace in both OR and system development that the problem which a team finally tackles is often not the one presented originally. Libraries are sufficiently complex systems that it would be useful to have available simple means of telling whether performance could be regarded as satisfactory which, if it could not, would also provide pointers to what was wrong.

Some measures relate to inputs—standard times and standard costs. They are relatively easier to construct than those that relate to outputs, but, in relying upon them, there is the obvious danger of achieving seemingly satisfactory use of resources by diluting the quality of service. An interesting approach which concentrates upon the effectiveness of document delivery has been developed by Orr and Schless.[8] A library's capability to supply documents is expressed in terms of the basic capability provided by its own stock, which is enhanced by interborrowing, and diminished as a result of losses due to inaccessibility, processing activities, housekeeping problems, and short and long term use. The approach allows these components of capability to be measured separately.

It would be interesting to try to base some simple tests on models relating effectiveness to cost. As an example from another field, it is easy to show that in a wide range of inventory problems, if an optimal ordering policy were being followed, average stocks would be approximately proportional to the square root of turnover; so a simple qualitative test is to plot average stocks against turnover for all, or a sample of, the items stocked and see whether the resulting curve has the right shape. An example in the library field might be based on Brookes' model of the photocopy versus buy decision for periodicals (if it were extended to incorporate effectiveness).[13]

There would seem to be considerable scope for the development of diagnostic aids in this field.

(*n*) *Data banks.* Gathering questionnaire data and preparing them for processing is a time-consuming and expensive part of many research projects. It would appear to be worth considering establishing a bank for certain types of data. If certain items on questionnaires were to take a standard form, an appreciably greater pool of data would be available for various analyses.

(*o*) *The metasystem.* This term was used in the IOR papers to describe 'the information flow in the library's or information service's control system'. An important part of the network is concerned with the user-server interface. An example of the research that could be undertaken would be an investigation of the dynamics of the relationships between users' perceptions of the quality of services and the extent to which they use them. For simplicity, assume that the effectiveness of a service could be measured by a single parameter, then if a user for whom the service could meet a need judged the effectiveness to be x whereas it was really y, we might hypothesize that if x were above some threshold level the service would be used and eventually x would approach y, but if x started below the threshold the service would not be used even though y might lie above it. Hypotheses for the way x depends upon experience (which would itself depend upon y) are available in the learning theory developed by psychologists.

Effectiveness measures

Any information system—whether it is a library, an information centre, or any other type of unit—exists to provide services. This is its function. It is viable if its provision is satisfactory. The need for effectiveness measures has been argued above. We are dealing with a situation that can be expressed as follows:

Services provided *Users served*
Potential—Actual— — — — — — — — —Actual—Potential

There are three main types of measure:

(1) Performance measures: the extent to which actual service to actual users is effective.
(2) Impact measures: the extent to which potential use is actualized.
(3) Availability measures: the extent to which potential services are actually provided.

The concept of 'service' must be interpreted broadly: any facility that the information system provides, whether material (a document on loan, a place to sit, a microfilm viewer, etc.) or human (bringing a document from the basement, answering an enquiry, making a photocopy, etc). Any particular measure—say, documents issued on loan—can be recorded as a whole, or subdivided by type of document, type of loan, or type of user, in whatever ways are appropriate to an individual system.

For actual services we can measure, over a given period of time:

(1) the volume of use—the absolute number of actual acts of use
(2) the use rate—the number of acts of use per actual user
(3) the success rate—the number of successful acts of use relative to attempted acts. 'Success' may be a simple yes or no, the item sought was found or not. It may be a more complex measure, e.g. the recall and precision achieved in a retrieval search, or the time taken to provide a service
(4) the value of the service. It may be possible to measure this objectively, e.g. user time saved, or the time during which the user was exposed to an information source. On the other hand, it may be a subjective rating
(5) the impact—the number of acts or use, or of actual users, per potential user. The number of potential users may be hard to estimate.

Services are the 'outputs' of an information system, and each of the above is a direct measure of the effectiveness of a service relative to one of a set of competing objectives. Clearly they are not substitutes for one another and it is important that they be considered within the context of the system's objectives. Where one activity within the system provides an input to other services it is possible to define intermediate measures of the effectiveness of its output. 'Inputs' may also be measured and we can assume that output is in some way dependent on input—though the dependence is unlikely to be linear, eventually there will be diminishing improvement in output as input effort is increased. We can measure the absolute volume of any input, and this relative to potential input, or to actual users, or to potential users. Processing time may also be used as an intermediate measure affecting output.

The meaning of a measure made at a particular time is not readily interpreted. A volume of use, a use rate, a success rate, a response time, a value assessment, an impact measure, an input measure, a processing time—each must itself be assessed in relation to:

(a) the corresponding measures for earlier periods of time;
(b) a 'standard' measure, that may be a corresponding measure in another information system, or the 'norm' in systems of the kind concerned, or the 'best practice' in such systems, or even user expectations and demands.

Conclusion

The range of themes for investigation by operational research methods, discussed above, is very wide. It is not a programme for an individual research and development team, but for the library and information profession as a whole. Its possibilities and implications need consideration at all levels of the information system.

Perhaps the most general effect of the project on Aslib has been to stimulate an attempt at formulation of the criteria by which might be chosen R and D projects (whether OR or not). So far there have been set down seven 'expected outcomes' of projects, each of which might be some justification for carrying out a project. What remains to be done is to assign weights to these outcomes, related to their value to the library and information community. The criteria (in no particular sequence) are as follows. The expected outcome is that the project will:

- –contribute to the development of generalizations in the library and information field;
- –provide practical guidance on the development or operation of a particular information system, or system component;
- –develop methods, measures, models or other aids that can be used in information system management, analysis, design, control or evaluation;
- –bring together current knowledge, information or data on some aspect of research, development or operation in the information field;
- –create a working system to provide some information service;
- –extend Aslib's expertise into new areas of the information field;
- –increase the contact and involvement of Aslib membership with R and D and its results.

The survey reported here presents a strong case for applying operational research methods to a system if there are difficult decisions to take regarding alternative courses of action; if these alternatives differ significantly in cost and/or effectiveness; and if there is relatively unconstrained freedom to choose between them. Situations of this kind undoubtedly exist in the library and information field, and we conclude that the potential contribution of OR to the field is significant.

It is clear, from the examples adduced above, that there are indeed problem areas in our field which the 'systems development' expertise currently available in the profession is inadequate to tackle. The range and quality of decision making will be enhanced by making the operational research approach an integral part of the profession's expertise.

REFERENCES

1 MACKENZIE, A. G., *and* BUCKLAND, M. K. Operational research, p. 224–31 in *British Librarianship and Information Science 1966–1970*. London: Library Association, 1972.
2 VICKERY, B. C. *Information systems*. London: Butterworths, 1973.
3 CHAPANIS, A. Men, machines, and models. *American Psychologist*, **16**, 1961, p. 113–31.
4 THOMAS, P. A. *Procedural model for the use of bibliographic records in libraries*. London: Aslib, 1970.
5 WILKIN, A. P., *with* REYNOLDS, R., *and* ROBERTSON, S. E. Standard times for information systems. *Journal of Documentation*, **28**, 1972, p. 131–50.
6 MARTYN, J., *and* VICKERY, B. C. The complexity of the modelling of information systems. *Journal of Documentation*, **26**, 1970, p. 204–20.
7 EVANS, E., *with* BORKO, H., *and* FERGUSON, P. Review of criteria used to measure library effectiveness. *Bulletin of the Medical Library Association*, **60**, 1972, p. 102–10.

8 ORR, R. H., *and* SCHLESS, A. P. Document delivery capabilities of major biomedical libraries. *Bulletin of the Medical Library Association*, 60, 1972, p. 382–422.

9 Included in ref. 11.

10 Briefly summarized by PENNER, R. J. Measuring a library's capability. *Journal of Education for Librarianship*, 12, 1972, p. 17–30.

11 BUCKLAND, M. K., *and others*. *Systems analysis of a university library*. University of Lancaster Library, Occasional paper 4, 1969.

12 BROPHY, P., *and others*. *A library management game*. University of Lancaster Library, Occasional paper 7, 1972.

13 BROOKES, B. C. Photocopies v. periodicals—cost effectiveness in the special library. *Journal of Documentation*, 26, 1970, p. 22–9.

14 Some general reference to OR: (a) ACKOFF, R. L. *Scientific method*. New York: Wiley, 1962. (b) DUCKWORTH, W. E. *Guide to operational research*. London: Methuen, 1965. (c) LAWRENCE, J. R. (*ed*). *Operational Research and the social sciences*. London: Tavistock Publications, 1966.

15 INSTITUTE FOR OPERATIONAL RESEARCH. The scope for OR in the library and information services field. OSTI report 5136, 1972 (available from National Lending Library).

Report Literature in the UK

Compiled by Aslib Information Department

THE MAJOR report collections in the UK are those of the British Library and the Technology Reports Centre of the Department of Trade and Industry. The British Library's loan collection is housed at what was previously the National Lending Library for Science and Technology at Boston Spa and the reference collection is held in the Science Reference Library, formerly the National Reference Library of Science and Invention, in London. Information on their holdings, announcement systems and report availability is given below and relates only to those 'unclassified' reports on which there is no limitation on availability.

Large collections of reports are also held by such organizations as the United Kingdom Atomic Energy Authority, Central Electricity Generating Board, Royal Aircraft Establishment, the Defence Research Information Centre, the larger industrial organizations and some university libraries, but none of these are 'publicly available' sources, although all may make copies available on loan in certain circumstances.

A. ORGANIZATIONS HOLDING 'PUBLICLY AVAILABLE' REPORTS

1. British Library, Lending Division, Boston Spa

(a) Coverage

Precise details of the specific reports series held and the dates of holdings are not available but, in general, the library holds unclassified reports from the following originating agencies:

American

US Government sponsored reports (e.g. AD, PB and COM series).
US Atomic Energy Commission (USAEC).
National Bureau of Standards (NBS).
National Aeronautics and Space Administration (NASA-N).
American Institute for Aeronautics and Astronautics (AIAA-A).
Educational Resources Information Centre (ERIC-ED).
Rand Corporation.

British

United Kingdom Atomic Energy Authority.
Aerospace establishments, British government departments, industry, universities and learned institutions.

Other

Documents of the European Communities (1973 onwards).
Atomic energy projects in most countries.

(b) Announcement of acquisitions

Since BLL holds virtually all unclassified reports issued by the American agencies listed above, the major abstracting services (listed in section B) can be used as announcement services for BLL holdings. In addition the following are issued by BLL:

(i) *Current serials received by the* NLL, *March, 1971.* (Titles only).
(ii) BLL *Review.* (News items).
(iii) BLL *Announcement Bulletin.* (No index).

Many of the reports held by BLL are listed in R *& D Abstracts* (see Technology Reports Centre, below).

(*c*) *Availability to users*
American reports in the series listed above are usually available for retention by users in the form of microfiche; otherwise photocopies may be purchased. Other documents, including British reports, are normally available for loan in hard copy form.

2. British Library, Science Reference Library, Holborn Division

(*a*) *Coverage*
The Science Reference Library holds a large number of report series, issued both by government organizations and by other organizations, such as university departments or research associations. Subjects covered by these report series extend over the whole field of science and technology and include agriculture, forestry, geology, mathematics, as well as the subjects associated with the well-known report series, such as atomic energy and aerospace technology. Some of these series are not necessarily called 'reports', bearing names such as 'research papers', 'bulletins', but must be included in any survey of 'report literature.'

Report series held by the Library include those issued by the following organizations:

(i) *American*
US Government sponsored reports. AD series. Most reports issued between mid-1964 and mid-1972 (nos. 600,000–743,000 approx.) are held on microfiche.
PB series. Nos. 108,720–210,000 (approx.) are held, with some deficiencies. Earlier reports in printed form; later ones on microfiche.
US Atomic Energy Commission.
National Aeronautics and Space Administration.
US Department of Agriculture, Forest Service.

(ii) *British*
UK Atomic Energy Authority.
Ministry of Agriculture, Fisheries and Food.
Ministry of Defence.
Department of the Environment.
Research associations, universities, etc.

(iii) *Other countries*
Atomic Energy Reports.
Reports from a wide range of research institutes, universities, etc.

(*b*) *Information on Holdings*
Report series are listed, together with other serials, in *Periodical Publications in the NRLSI* (1969/71). New series are listed in *Periodical News, Official Journal (Patents)* and, if of major interest, in *SRL News* also.
The major abstracting and bibliographical journals covering report literature (listed in Section B) are the main source of information on reports currently being issued.

(*c*) *Availability to users*
All reports held are freely available to the public for reference, many of them on open access. The AD and PB series and the USAEC series are at the Kean Street annexe. The majority of the others are held in the main library at the Holborn Division, though a few are held at the Bayswater Division.

Photocopies can be provided (in eye-legible size if held on microfiche).

If a particular report is not held, the SRL will endeavour to borrow it from another part of the British Library or other appropriate source for use by a reader in SRL.

3. Technology Reports Centre, Orpington (Department of Trade and Industry)

(*a*) *Coverage*
The Centre holds the majority of unrestricted technical reports produced in Government research establishments, together with reports from other UK organizations, particularly those carrying out Government sponsored research. Holdings are particularly strong in electronics, aeronautics, materials technology and mechanical and electrical engineering. The Centre also receives the openly-available reports of the US National Technical Information Serivce and NASA and other US and overseas organizations under exchange agreements.

(b) *Announcement of Holdings*
R & D Abstracts—Virtually all British and a selection of overseas report accessions are announced in the Centre's journal *R & D Abstracts*. It includes some reports held by BLL but not by TRC. It is issued twice a month and each issue contains subject, author and report number indexes. More comprehensive cumulated indexes are issued every six months.

(*c*) *Availability to users*
The Centre prefers to sell copies of reports, either as paper or microfiche, at the cost of reproduction, but loans will be considered under certain circumstances.

B. MAJOR ABSTRACTING AND BIBLIOGRAPHICAL PUBLICATIONS COVERING REPORTS

(i) *Government Reports Announcements (GRA).* US National Technical Information Service, fortnightly, 1971 onwards.

An index to US Government reports which covers Defence Documentation Centre (DDC) documents (AD reports); Publication Board reports (PB);

Department of Commerce reports (COM); other reports released by US Government agencies and their contractors; many foreign reports; US Government-sponsored translations and theses.

(Previously published as *Bibliography of Scientific and Technical Research*, 1946–1949; *Bibliography of Technical Reports*, 1949–1954; *US Government Research Reports*, 1954–1964; *US Government Research and Development Reports*, 1965–1970.)

(ii) *Government Reports Index (GRI)*. US National Technical Information Service, fortnightly.

Published concurrently with *GRA*, it indexes *GRA* abstracts by subject, personal and corporate authors, and government contract and order numbers. The present format began in 1964 with *Government-wide Index to Federal Research and Development Reports*; previous to that there were numerous changes of title and format.

(iii) *Nuclear Science Abstracts (NSA)*. US Atomic Energy Commission, fortnightly, 1947 onwards (sold by US GPO, Washington).

Covers reports of the USAEC and its contractors, and technical reports of other US agencies, foreign atomic energy agencies, universities, industrial and research organizations, as well as patents, books and journal articles in the fields of nuclear energy and associated subjects. Each issue has indexes by personal author, corporate author and subject, as well as report number indexes indicating availability of the reports. There are quarterly, semi-annual, annual, and five-year cumulations, together with separate report number indexes covering 1947–1961, and 1962–1966 respectively.

(iv) *Scientific and Technical Aerospace Reports (STAR)*. National Aeronautics and Space Administration, fortnightly, 1963 onwards.

Covers NASA reports together with national and international series of reports, translations, theses, etc. of interest in space research. Individual issues and cumulative volumes have indexes by subject, personal and corporate authors, contract number and report number. Cumulations are quarterly and annual.

(v) *International Aerospace Abstracts (IAA)*. American Institute of Aeronautics and Astronautics, fortnightly, 1961 onwards.

A complementary publication to *STAR*, with the emphasis on conference papers, journal articles, etc. Each issue has an author index, cumulated quarterly, and there are separate annual author and subject indexes.

(vi) *Research in Education*. Educational Resources Information Center, monthly, 1966 onwards.

Approximately two-thirds of the abstracts relate to research reports, the rest being abstracts of books, conference papers, theses and journal articles. Each issue contains a subject index, personal author index and corporate author index and these are cumulated semi-annually and annually.

(vii) *Selected Rand Abstracts.* Rand Corporation, quarterly, 1963 onwards.
A guide to unclassified publications of the Rand Corporation. Issues are cumulated through the calendar year with subject and author indexes covering all the material abstracted in the current volume. A cumulated index covering selected publications for 1946–1962 is also available.

(viii) *R & D Abstracts.* Technology Reports Centre (See Section A(3) above).

(ix) *Microfiche Accession List.* Technology Reports Centre.
An irregular list of report titles prepared from the magnetic tapes of *Government Reports Announcements,* intended to provide current awareness of recent reports with AD and N accession numbers.

(x) *UKAEA List of Publications available to the public.* AERE, Harwell, monthly, 1955 onwards.
A list of reports, translations, patents, journal articles, etc. written by UKAEA staff. Annual cumulations are issued with indexes to report numbers and authors, and these can be purchased from HMSO.

C. OBTAINING REPORT LITERATURE

UKAEA documents are the only British report series listed comprehensively. For most reports the normal procedure is to try the British Library first, then TRC; the latter may take some time to process the request and a negative answer does not necessarily mean that the report is unobtainable. Two factors are relevant: first, the identification and verification of the details which give access to the report, e.g. AD number; secondly, the degree of public availability, e.g. 'limited' markings in which case a need-to-know may be required. The Aslib Information Department can often give assistance in the first instance, by identifying and locating reports.

Would-be users do not always know whether a report is one of a series covered by *GRA* or other publications. The answer can usually be found by reference to such guides as the three listed below.

It is usually difficult to verify details of reports issued by organizations in countries other than the UK and USA. It may be possible to obtain the location of the originating body from the appropriate embassy, but this does not always lead to an informative reply.

Guides to report series

(i) GODFREY, L. E. and REDMAN, H. F., *eds. Dictionary of report series codes,* 2nd ed. New York: Special Libraries Association, 1973. 645 pp. £19.

(ii) SIMONTON, D. P., *comp., Directory of engineering document sources.* Newport Beach: California; Global Engineering Documentation Services, 1972. £29.95.

(iii) SMITH, J. ROLAND, *ed. Guide to UKAEA documents,* 5th ed. London, HMSO, 1973. 48 pp. £0.30.

BRIEF REVIEWS

CODLIN, E. M. *ed.* Handlist of basic reference material in electrical and electronic engineering. London, Aslib Electronics Group, 1973. 64 pp. £2, members £1.25.

The basic layout and subject coverage of the latest edition of this *Handlist*, designed as a reference tool for librarians and information officers serving electrical and electronics engineers, remains unchanged although efforts have been made, in view of Common Market entry, to include more publications covering European sources particularly trade directories and tables, also dictionaries. Changes in industrial policy have also been a factor in increasing the number of publications listed, from just over 500 in the 5th edition, to nearly 650 current entries. Publications are classified by form into twelve groups as in the previous edition; arrangement within each group is alphabetical by author. Bibliographical details also include title, edition, publisher, date, pages and price. In certain sections references to periodical articles have been included. Where necessary for elucidation of the contents, a brief annotation is given. Author and simple subject indexes are provided as before.

Revised by members of the current Electronics Group Committee this useful *Handlist* should surely be included amongst the basic reference material in most technical libraries.

HARVEY, J. M. Statistics-America: sources for market research (North, Central and South America). Beckenham, Kent: CBD Research Ltd, 1973. 225 pp. £6. (SBN 900246 13 8)

This directory is the third in the series which includes *Statistics–Europe* and *Statistics–Africa*. It gives details of sources of statistical information from each country of both American continents and adjacent islands. The format and form of entry are consistent with the other directories in the series: entries are arranged alphabetically by country, preceded by a general section dealing with America as a whole.

For each country, information is provided on the central statistical office and other important organizations and libraries, both in the country and elsewhere; and details are given of the main current bibliographies of statistics, and of the major statistical publications, arranged under such headings as external trade, population, etc. There is an index of publication titles; a short index of organizations, and a trilingual index of countries. Where sources are prolific, Miss Harvey has selected the major sources only, but even so the amount of information for each country varies, from 22 pages for the United States to an average of 2 pages for each country or state in Central America and the West Indies. In fact, bibliographies of statistics are available for only the major countries, and there are few publications on internal distribution and standard of living for most countries; but cross-references are given to more general publications which include such information.

This directory will be a useful addition to a series which has already proved its worth as a guide to world sources of statistics.

INFORMATION OFFICER

Albright & Wilson Limited, Marchon Division, Whitehaven, Cumberland, chemical manufacturers, have a vacancy for an Information Officer.

The vacancy is in the R & D Department reporting to the Manager of the Analysis and Information Unit. Main duties will entail the preparation and distribution of current awareness bulletins, assisting research chemists with literature surveys, and answering technical enquiries. The present staff of the unit consists of a Librarian and a typist.

Applicants, male or female, should preferably be graduates in Chemistry and should have some previous experience of abstracting, or scientific information work. Knowledge of a foreign language would be useful and the preferred age range is 25 to 35 years.

The commencing salary will be commensurate with qualifications and experience. There is an excellent Pension and Life Assurance Scheme and, where necessary, assistance can be given towards removal expenses.

Whitehaven is attractively situated on the fringe of the Lake District which provides a wide range of leisure activities.

Please write for an application form to the Staff Officer, Albright & Wilson Ltd., 1 Knightsbridge Green, London SW1X 7QD (Ref. 278A).

FIRST for carpets

Dodson Bull

UP TO 30% DISCOUNT

BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display

In our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-6 North Road BN1 1YA. Tel: 68402
BRISTOL: 2-3 Royal London House, Queen Charlotte St BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LG.
Tel: Southend 46569
9.00-5.30 Mon.-Fri. Sat. 9.00-12.00 (Manchester 9.00-4.00)

Australian Government
Department of Supply – Canberra

Librarian:

$A9,371-$A10,534
(about £5,100-£5,750)

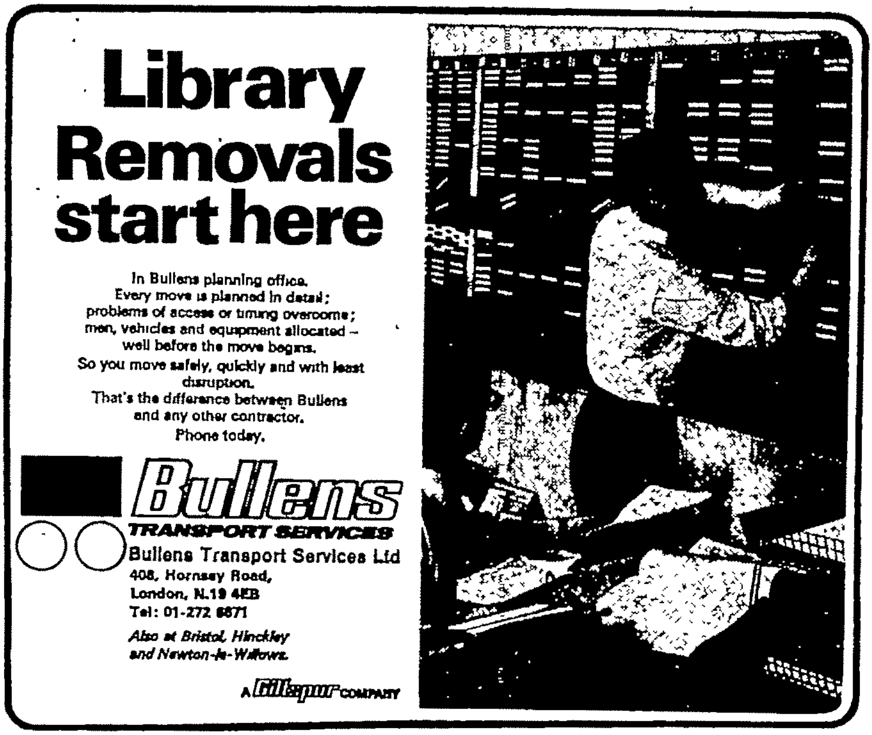
Department of Supply is a vital part of Australia's defence organisation, supporting the Navy, Army, and Air Force in defence production, research and development, procurement, transport and storage. It is a uniquely versatile Department, responsible for – among other things – the operation of the Woomera rocket range, five laboratories, four space-tracking stations, 13 factories, a tropical research unit, a balloon-launching station and a transport fleet of about 4,200 vehicles.

The position is in the Central Library of the Department in Canberra and involves design, review and modification of departmental information retrieval and library modernisation techniques, as well as the preparation of job specifications for ADP applications, and liaison with main user groups concerning subject interest profiles.

First-class air passage will be provided for you and your immediate family, plus generous baggage allowance. Salary will be paid from embarkation date. Annual leave totals 4 weeks, and cumulative sick leave applies. An attractive superannuation scheme also operates.

Necessary qualifications are a university degree plus the equivalent of a Registration Certificate of the Library Association of Australia. The Principal Librarian of the Department, Mr H J Zwillenberg will be visting Britain in September 1973 and will be interviewing shortlisted applicants. Please address your application and/or any enquiries, quoting reference 3168/AP, to:

The Senior Representative,
Department of Supply,
Australia House,
Strand, London WC2B 4LA
(Tel: 01-836 2435, Ext. 505 or 371)



Library Removals start here

In Bullens planning office.
Every move is planned in detail;
problems of access or timing overcome;
men, vehicles and equipment allocated –
well before the move begins.
So you move safely, quickly and with least disruption.
That's the difference between Bullens
and any other contractor.
Phone today.

Bullens
TRANSPORT SERVICES
Bullens Transport Services Ltd
408, Hornsey Road,
London, N.19 4EB
Tel: 01-272 6671

*Also at Bristol, Hinckley
and Newton-le-Willows.*

A Gillspur COMPANY

SCIENTIFIC BOOKS,

LIBRARIES AND COLLECTORS

3rd edition by

John L. Thorton & R. I. J. Tully

Scientific publications and their patrons from before the start of printing to the present. An outstanding 85-page bibliography is complementary to a fine piece of scholarly research.

£7 (*£5.60 to L.A. members*)

THE LIBRARY ASSOCIATION

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

7 JAN 1974

FOR TRACING AND RECALL

of $\left\{\begin{array}{l}\text{specific}\\\text{recent}\end{array}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib

CENTRAL LIBRARY
UNIVE

x

Proceeding

Preparation for library management: contribution of the library school *L. J. Patrick*

INSCOPE: a co-ordinate index in the field of applied economics *C. P. R. Dubois*

Adverse drug reactions report: their storage and retrieval *M. R. Slater*

The London Classification of Business Studies. Towards a revised edition *K. G. B. Bakewell*

SEPTEMBER 1973
VOL. 25, NO. 9

Aslib Proceedings

VOLUME 25 SEPTEMBER 1973 NUMBER 9

© Aslib and contributors

Aslib Proceedings is *published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer back, Aslib London

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

Preparation for library management: contribution of the library schools*

L. G. Patrick✠†

> 'Educate a man for change; train him for a static situation.'
> K. J. McGarry.
> 27th April, 1973.

Introduction

TOO OFTEN in the past we have been content with vocational training in technical skills; this contentment both arose from and helped to give rise to relatively static situations. Today, when one of our greatest certainties is the inevitability of change we need 'to prepare individuals who will be not only competent to perform and manage the present systems but who, through their educational experience, will have the necessary insight, imagination and habits of mind, needed to improve and to enhance the system by adapting and advancing it to meet its future requirements'[1] (P. Wasserman). Within the last decade the provision of facilities for education and qualification in librarianship has broadened and diversified to a degree which is complex, not to say confusing.[2] This variety of provision is to be commended and is both natural and correct for our present situation. Today it is impossible to set down one definitive pattern of education for librarianship and regard it as the ideal. It is improbable that a curriculum could be agreed by all and not everything important in education appears in a curriculum.

In the UK today the schools have a high degree of freedom and they each use it, in accordance with their own individual ethos, to build up courses which differ in content and teaching method. Natural selection will, in due course, show which are the more successful but overall it is certainly correct to say that the schools are producing young people who are more widely and variously educated in librarianship and areas related to it than ever before. It is also reasonable to believe that they are being educated for change rather than trained for static situations as in the past. We now consider the extent to which the education being given will lead to a satisfactory understanding of management principles, techniques and practice in relation to librarianship.

It is not intended to attempt any comprehensive survey of what British library schools are doing in preparing their students for library management. All the schools have been written to and much help in the matter given. With this information, recent and authentic, it is intended to build up a kind of collage which it is hoped will provide a reasonably correct overall picture of the present situation; there is no intention of describing the position at any one school. A fuller published account is available in the report of L. C. Guy[3] which reviews the state of the art of education for library management. The following statement may be useful as indicative of the overall position as ascertained in L. C. Guy's survey (p. 80):

---

* Paper to Aslib Midlands and Northern Branches, Joint Annual Conference, Llandudno, May 10–12, 1973.

† Late Principal Lecturer, Department of Social and Management Studies, College of Librarianship, Wales.

> In most courses that have been surveyed students are made aware of existing management terminology and definitions, and at an elementary level, of management techniques. Some courses pay greater attention than others to particular aspects of management, e.g. O and M, systems analysis, or personnel management. Because most of the courses investigated in this survey are concerned with basic librarianship, however, no aspect of management is taken very far, and this is understandable.

The following statement of R. Sturt is also indicative of the present position so far as techniques are concerned:

> ... a consensus of library school opinion in the matter of teaching management techniques was attained at Cambridge in March 1971, when at the conclusion of a seminar organised by the Library Management Research Unit, 'it was generally agreed that at levels up to first degree, all that could be given was an appreciation and awareness of management techniques'.[4]

Factors contributing to this situation include time, maturity and motivation of students. Thus, one school writes:

> With the time at our disposal it is not possible to go beyond an appreciation of basic management principles and techniques and their application in library situations.
>
> ... they should regard my course as one of appreciation rather than fitting them immediately to manage or use management techniques.

More mature students, especially those with some library experience, are better able to comprehend the importance of management aspects of the courses. The less mature are more likely to show lack of comprehension regarding management principles and techniques. This is partly because of their lack of experience of management situations and L. C. Guy[3] (p. 76) reports a definite lack of motivation to study management beyond an elementary level. He relates this to the fact that about 75% of the profession leave after 4½ to 5 years of service and he claims 'Whatever may be the reason for the choice of librarianship as a career by the majority of entrants, it does not seem to be a desire to achieve senior positions'. In confirmation of this one school writes:

> I attempt little more than the identification of, and an understanding of the nature and significance of techniques and management 'styles'. Frankly more would be beyond our students, most of whom show a certain indifference to the importance of the study. The overwhelming preponderance of young women doesn't help—its usually the male who seems to take to it.

Some schools find it possible to do more than this, some courses contain a greater management element than others, e.g. L. C. Guy[3] (p. 71) reports that at two schools 'some aspects of management are taught in depth (for instance statistical methods)'. One can add that in all courses known personally to the speaker, not least the 2-year Library Association course, one finds some students to whom management as a subject of study is important, relevant and reasonably comprehensible. It may be that in some of these cases the students are destined for high responsibility. The others, however, will all as professional librarians be involved in management situations. Some reach middle management surprisingly quickly and will need all the help the schools can give whether they now realise it or not.

> . . . will become *part* of management and therefore should understand management processes; they will also be managers themselves (albeit in a small way) or be managed by someone else—so they should be able to analyse what is happening.

What is the contribution?

One school writes:

> Teaching management here aims at producing young librarians able to cope at middle management level. We think that there should be special courses later after some years of experience to educate librarians to higher levels of management.

Another school writes:

> Aim throughout is to reveal the general principles and objectives of management as they arise in the various segments of work and thus establish a reasonable philosophy for action. In the main, details of techniques are omitted. Instead, the reasons for doing a particular job are sought. Thus we seek to get the student to see the broad or whole picture and to think hard about the reasons for doing each job in the way that it is done. We hope the right attitudes are created on the way along and that the prospects presented will make the student feel that he (or she) has a challenging job ahead of him such that in turn he may do something to reform libraries and run them more effectively than at present.

At another school the aim is to give a broad approach to management through emphasis in all courses on the social context of libraries, the historical background to some extent and an understanding of basic management principles coupled with an awareness of management techniques. The aim is not to produce an academic, special or public librarian but a librarian who could adapt a basic understanding of management to whichever kind of library he later found himself employed in. Such an aim should not preclude individual studies in depth in management aspects of particular types of library.

Several schools make the point that management matters cannot be limited to that part of the course so called. Thus,

> Management aspects are thought about in all parts of the course.
>
> There is some evidence that the time has perhaps come to cease labelling 'management' as something separate and apart. Certainly management aspects are more and more being considered in relationship to, and sometimes dictating, technical aspects of information retrieval and services, etc. I therefore personally find it necessary increasingly to liaise with other tutors on various aspects of my own course—not necessarily to avoid duplications, but to ensure that the respective presentations are 'keyed into' each other.

What is taught is clearly a significant matter for consideration but the present circumstances are inappropriate for the provision of a list of themes. Such a list would be meaningless without information being supplied as to the depth to which each theme is taught or studied in each course and how it is taught or studied. This is impractical here. As an alternative the speaker would select three matters which he believes to be of the greatest importance in education for library management. They are, in order of importance:

(1) *Objectives of Libraries.* Fundamental to any management function is a clear understanding of objectives. To teach students to determine objectives,

i.e. to have specific goals as an essential prelude to action and to analyse current problems in relation to overall objectives is of first importance. Clearly this cannot be done without taking into account the environment of the library, the objectives of the parent organization, the needs of users and potential users. The objectives need to be of both a long and short term nature and kept under constant review. Students need to be warned of the danger of being so busy about today's affairs that there is no time for planning tomorrow. These matters can be taught as a matter of principle in the abstract but are better learnt through a student's own investigation of an actual library situation, e.g. on field work. One can clearly superimpose on this principle the technique of management by objectives (MbO) where some form of quantitative measurement of work is involved. This technique is understood to be common in Government libraries but it is also, of course, used elsewhere. There is a clear distinction here between management principle and management technique. One school writes '. . . important not to confuse techniques with management'.

(2) *Management of Human Resources.* A sound definition of what is meant here is as follows: 'The management of human resources is concerned with the optimum deployment and development of people within an organization in order that the objectives of the organization may be met and effectively adapted to changing circumstances'.[5]

It is a fact that the degree to which these aims may be achieved will be largely influenced by the extent to which the needs and aspirations of those working in the organization are recognized. Among the important aspects of this matter one would mention encouragement of motivation, sound organization, good communication, proper delegation, conditions of employment. These matters are readily acceptable by students as important but since they involve human relations full comprehension and sound judgment can only be expected with maturity and experience.

(3) *Management of Financial Resources.* If common-sense alone urges the best management of financial resources, the current emphasis on cost-effectiveness gives it added importance. Students preparing for management need to be aware of this widespread interest in costs in relation to all forms of library service. To what extent is this awareness conveyed to students? R. Sturt has reported on the teaching of costing techniques to librarians and information scientists.[4]

From his survey the author concludes that while some schools undertook no substantial teaching of costing techniques the position was different in other schools and particularly so in the case of more mature students, e.g. those in the final year of a degree course or on a post-graduate course. Overall, his conclusion is 'that there is far more attention paid to costing techniques in 1972 than ever seemed possible in 1967'. However, R. Sturt adds 'A technique is a tool used towards the attainment of an objective. A prerequisite to the use of the tool is understanding of the objective for which the tool is selected. It is that understanding, managerial understanding—insight if you like—which we should be trying to inculcate, to a greater or lesser degree, in the process of library education'. Whether schools teach costing techniques or not all must convey to their students the need for prudent use of financial resources while making clear that there is sometimes a distinction between efficiency and effectiveness.

There is widespread agreement that specialist courses for librarians with greater maturity and experience than those following a course for a first qualification are essential.

The following comments from three schools will illustrate this:

> In my view, most instruction on management theory and techniques in librarianship should be given on a special course whenever appropriate several years after the completion of a student's initial full time course in librarianship.
>
> *Principles* of management are taught . . . we believe that *detailed* study of management techniques, e.g. operational research, etc. is only of value at post-experience level through short courses, professional up-dating courses, etc.
>
> Students in all our courses are introduced to some management techniques, e.g. principles of O & M, work study methods, costing, job analysis and description. Inevitably any technique can only be treated superficially.
>
> As to significant developments in the future. The subject of management is vast and senior librarians need to have knowledge and experience of a wide range of techniques. But I feel we can no more produce the complete chief librarian on a first course than a college of education can produce the complete headmaster. The answer must lie in detailed post experience courses. There are many of these but too often they are not appropriate to librarianship. What I would like to see is the L.M.R.U. continuing to refine and devise management techniques for library purposes, and the establishment of a single 'staff college' as part of it. I envisage a combined staff college and research unit as a part of the British Library. In particular I would like to see courses in statistical methods for librarians. I form the impression that there is an innumeracy barrier and that remedial courses in basic mathematics are desirable.

With regard to numeracy another school comments as follows:

> My major task is to give our students an awareness of the importance of numerical methods in Library Management, in the hope that they will carry this into their subsequent professional life. To this end, I cover a variety of simple statistical tests in connection with surveys of library and book usage, etc. Students do a large number of worked examples which demonstrate library surveys in action. When we come to discuss the various hyperbolic distributions which occur in librarianship it is encouraging to find that our students are no longer daunted by the sight of mathematical statements on the blackboard.

Schools do provide a number of short courses details of which are circulated by the Department of Education and Science.[6] This provision will need to be increased further in later years for the sake of those properly motivated to management as also for the purpose of improving the quality of management in libraries.

How is the contribution given?

Teaching methods are much more varied than in earlier years. Chalk and talk still play an important part especially in the more elementary stages. Methods, additional to conventional lecture and classroom instruction, include: directed readings, seminars, case-studies, in-basket exercises, tutorials, role playing, project-work, etc.

More than one school finds study of actual problems in library contexts more helpful than devised case-studies. Thus a school writes:

> We have not tried out the simulated management games but much of the work is based

> on real case histories. In library planning, for example, transparencies from plans in Architects' Journals, in some cases photo copies of actual plans, film slides and film strips, together with details from planning briefs, are used. For a number of management exercises the actual reports of libraries are used in order to elucidate details of budget innovations, and developments for comparative study of various groups of libraries. As far as possible we use the practical exercises; this last term, for example, four groups each went to one particular library to look at and discuss the practical aspects of book selection with the librarians involved. The reports produced by each group were collated and discussed both in seminars and in general classes. We have done similar exercises with regard to book charging systems, reservations, etc.

Another gives students practical experience in carrying out a sample O & M study. The services of outside experts or colleagues in management departments are used. A most important element is through the greatly appreciated contribution of libraries and their librarians. Field work provides opportunity to study one library system in depth, while study tours permit students to see a range of different kinds of library. One school incorporates some more practical elements such as job applications, mock interviews, use of telephone and AV equipment, etc. The latest development is that virtually all the schools have shown interest in using the library management games developed in the University of Lancaster Library Research Unit.[7] Games have been developed, e.g. in relation to the availability of books in a library and optimization of book processing. The games are devised for educational rather than operational purposes and use a computer. It is expected that they will be used as from the next academic year in one or two schools at least. These new methods open up new dimensions in education and enable the schools to make a contribution very different from that possible by the lecture method. They involve participation, encourage individual thought, independence from the teacher, analysis of a situation and in the games make it possible to simulate real-life situations as students can see how a number of variables work together in ways not possible before. 'Underlying the learning process is the fact, not yet sufficiently recognized in practice, that what is learned cannot be separated from the way in which it is learned. Those planning appropriate learning experiences should recognize this and should provide ample opportunity for theory to be learned through practice and for practice to be interpreted and reinforced by theory.'[5b]

What does the contribution do?

There are those students who because of certain factors are likely to do less well in management than others. Some, however, are capable, seriously motivated to librarianship, responsible and eager to make their own contribution. They are observant and critical. Here for example are some observations of students on field work situations earlier in 1973:

> Thanks to the effort of recently appointed senior staff who form a formidably and energetic coordinated group at middle management level.
>
> This is probably one of the most sophisticated and all-embracing instance of the implementation of MbO in the country . . . These techniques are extremely useful to the librarian . . . He clearly believes these techniques are helpful and . . . he appears to be gaining some success.
>
> All power and decision making rests in the hands of the librarian and his deputy and channels of communication are virtually nil.

> Although the library has been fairly well managed, in terms of finance and materials, I feel that the human side of the management need to be improved.

One school reports as follows:

> In relation to expectations of those leaving the School, I warn them that not all libraries are yet sympathetic to a vigorous management approach and are not geared to a systematic collection of relevant data. I tell them that this must change, if only because we more and more need to convince others outside the profession of the worth of our services and of our ability to direct them properly, and for this we must get used to presenting data properly. I also tell them that they must not necessarily expect all their bright ideas to find immediate favour for a variety of legitimate, as well as other, reasons; nevertheless any library which does not encourage the putting forward of ideas is probably moribund.

In the speaker's view the contribution is leading to the production from our schools of many young people of good promise, better educated than ever before and the best of these are correspondingly desirous of applying their motivation to service in positions of responsibility within a reasonable time. I do not refer so much to responsibility within a strictly authoritarian hierarchical system but more in the nature of team working where there is participation in decision making. The response these young people need from their future employers is initially one of help and encouragement inclusive of sound training into all relevant matters that would help them to understand the specific library system and be effective in it. The matter is dealt with very well by S. J. Butcher: 'Staff training based on participation and involvement in the affairs of the system is a necessary post-qualification activity in a profession whose keynote is teamwork and selflessness.[8] With a background of education and training the young professionals need then to gain experience in an atmosphere which combines both a sense of responsibility with working as part of a team.

Industry

A request was made that these matters be considered from the viewpoint of industry. Relatively few students seem to be much interested in industrial librarianship as a first post. Most seem to have their eyes on either public or academic librarianship. This is thought to be sound although some have gone straight to industry or commerce with success. If industry is to attract capable librarians from among young people today its best appeal is likely to be by stressing the opportunities for challenge, involvement and creativity. The scope of industrial librarianship is broadening to cover, in addition to science and technology, the economic, commercial and sociological fields. Mergers of companies make large scale operations essential, permitting more sophisticated forms of service viable, sometimes in relation to world-wide information networks. Industry has been passing through a difficult period but its need for information has never decreased. L. Wilson has said:

> Our objective ought now to be the integration of all company information activities into a single function, under a unified information policy and carried out by a professional information systems manager.[9]

Such a concept certainly justifies all that can be done in the schools in preparation for management but a first course would be quite inadequate. We may, however, be sure that the more highly motivated and able students will themselves complete the work started by the schools in their individual preparation for higher management. Short courses must form an integral part of this pattern of development. Our basic needs in this respect and their means of provision is an important issue for consideration.

Conclusion

Management has appeared in the curricula of the library schools increasingly during the last decade but much of it is taught or learned in first courses only at a level of appreciation or awareness. During this time there has been a very considerable development in the educational nature of the courses provided and there is a widespread agreement that post-experience courses are essential as preparation for higher management. The degree to which the present British Library schools contribution to library management is successful or not will only be known overall in the future. In an age when change is certain, when the role of librarians is changing, one standard by which they may be judged is that set down by Jesse H. Shera:[10]

> The library school should be the main source of professional change—of new ideas.

Is it?

Acknowledgements

Information and comments were kindly supplied from each of the following library schools: Belfast, Brighton, Leeds, Liverpool, London (UCL and Ealing), Loughborough, Manchester, Sheffield, Strathclyde, as also from colleagues at Aberystwyth. These are gratefully acknowledged.

REFERENCES

1 WASSERMAN, P. Educational issues in international information systems development. International Seminar in Information Science, Veszprém, 1972.

2 LIBRARY ASSOCIATION. Library Education Group. British qualifications in librarianship. 1972.

3 GUY, L. C. The state of the art of education for library management. In University of Lancaster Library Occasional Paper No. 7, 1972, 67–87.

4 STURT, R. Teaching costing techniques to librarians and information scientists of the future. *Aslib Proc.*, June 1972, **24** (6), 350–355.

5 DEPARTMENT OF EMPLOYMENT. The management of human resources. HMSO, 1972, (a) p. 9, (b) p. 13.

6 DEPARTMENT OF EDUCATION AND SCIENCE. Directory of short courses in librarianship and information work. No. 23, June 1973.

7 BROPHY, P. and others. A library management game: a report on a research project. 1972. In University of Lancaster Library Occasional Paper No. 7.

8 BUTCHER, S. J. Staff training in libraries. Paper to North Western Branch of the Library Association, Alston Hall, Preston. 23–25 February 1973.

9 WILSON, L. Disc. *Aslib Proc.*, Dec. 1972, **24** (12), 662.

10 SHERA, J. H. *The foundations of education for librarianship*. Becker and Hayes Inc., 1972, p. 496.

INSCOPE: a co-ordinate index in the field of applied economics

C. P. R. Dubois

Research Officer and Head, Library and Information Section, International Coffee Organization

A description is given of an optical coincidence feature card co-ordinate index for retrieval of information on commodity economics. The nature of the subject language and operational environment have been prime system construction determinants. There would seem to be little difference for index language construction between the field of commodity economics and scientific and technical fields, apart from a large amount of ephemeral material for which a special handling technique has been developed.

SINCE there would still seem to be a relative scarcity of post-co-ordinate retrieval systems in the field of economics and indeed in the social sciences area in general, it is felt that a description of the construction and operations of the retrieval system used by the International Coffee Organization may be of interest. Other fully documented systems in analogous subject areas (United States government departments, International Labour Office, Organization for Economic Co-operation and Development, Food and Agriculture Organization, etc.) tend to be computerized retrieval systems operating with high input rates in relatively broad fields, whereas INSCOPE (Information System for Coffee and Other Product Economics) operates with feature cards on a more modest scale.

Field of interest

The International Coffee Organization (ICO) is an inter-governmental organization established to administer the provisions of the International Coffee Agreement and supervise its operations. The Agreement first signed in 1962 was renewed in 1968 for a further 5 years with the addition of a Diversification Fund, to which the larger coffee exporting Member countries pay special contributions with the object of financing projects designed to assist countries to adjust their supply of coffee to expected world demand. The overall objective of the Agreement is to regulate world trade in coffee (historically subject to severe fluctuation in prices and production) in the interests of both producers and consumers.

In the context of the work of the Organization information is thus required on all economic aspects of production, distribution and consumption of coffee, together with similar information on other commodities suitable as crop diversification alternatives.

With regard to the data base, the ICO Library contains approximately 4,000 volumes, with a high percentage of non-conventional documents, and receives about 400 serials. Indexing according to INSCOPE was introduced in February 1973.

System construction parameters

The starting points and chief determinants of the structure of INSCOPE have been:

(i) The nature of the subject area language.
(ii) The requirement to reduce costs to a minimum in the context of a closed-access environment.
(iii) The desideratum of compatibility as a microsystem within the projected worldwide AGRIS system (International Information System for the Agricultural Sciences and Technology).
(iv) The particular difficulties encountered in the dissemination of information in the area of commodity economics.

Albeit subjectively assessed, the language of commodity economics is reasonably 'hard'. Useful published vocabularies include those used by the United States National Agricultural Library[1] and the FAO Documentation Centre. Specialist terms referring to the operations of the International Coffee Agreement have also been developed within the ICO.

On this basis it was decided to generate a vocabulary through the interaction between free indexing and a previously constructed guideline term list. Wherever possible this initial guideline list of terms was established using the Agricultural/Biological Vocabulary,[1] since it is projected that this will form the basis of AGRIS.

In view of the fact that INSCOPE is a closed access system, operated either by the staff of the ICO's Library and Information Section or by members of the staff who have received instruction in its use, and in the light of modern index language research, it was decided to dispense with hierarchical displays and reduce hierarchical structure within the term list to a minimum. Thus broader terms are incorporated on a relatively unsystematic basis when the relationship is considered significant in the context of information requirements. Use is also made of scope notes and 'See also' references as search aids. Following a suggestion made by Jones[2] a slightly modified form of natural language is used for the main area of commodity economics whilst peripheral subjects are contained by compression. Again following Jones[3] the coffee area is separated from other products by role indicators. Thus the descriptor PRICE ELASTICITY (COFFEE) is separated from PRICE ELASTICITY (OTHER REFERENCES). Information on the price elasticity of commodities other than coffee would be indexed by the combination of the 'other references' role and the commodity descriptor, e.g. PRICE ELASTICITY (OTHER REFERENCES)+CACAO.

Vocabulary compression, as stated before, is more significant in peripheral areas although clearly some degree of compression is inevitable for the practical operation of a feature card system.* A feature of INSCOPE compression is that it is determined by likely frequency of occurrence of terms rather than the type of relationship. For example the descriptor MECHANIZATION is used for the lead-in terms 'Agricultural machinery' and the lead-in 'Slaughter-houses' is referred to MEAT, together with synonymies such as 'Cocoa'... Use CACAO.

---

* INSCOPE uses a main pack of 10,000 capacity optical coincidence feature cards (Anson) with a Co-ordinate Drill/Reading Unit.

The effectiveness of the compromise between natural language and compressed term, although subjectively apparent in use at the ICO has, of course, been given a degree of confirmation by the Aberystwyth index languages test.[4] Clearly in the case of commodity economics, in which there are frequent difficulties in obtaining information of any kind from developing countries, recall has a much greater priority than precision.

Ephemeral material

Information in the field of applied economics, especially if developing countries are concerned, is obtained in a radically different way from information about theoretical economics as recently described by Fletcher.[5] For instance, whereas the latter gives a journal to non-journal ratio of 47.3:52.7 for academic economics in 1968, an analysis of 3 months INSCOPE input gave a ratio of 63.8:36.2, a similar ratio to those found in science and technology.[*] Moreover there is an extremely high proportion of non-conventional material in this input. The full breakdown was as follows:

Journal articles	49.7%
Quasi articles (Short items of text, newsletter items, etc.)	14.1%
TOTAL JOURNAL MATERIAL	63.8%
ICO Documents	22.8%
Publications from other International Organizations	7.6%
Government Publications	2.9%
Other non-journal	2.9%
TOTAL NON-JOURNAL MATERIAL	36.2%

As is to be expected, the requirement of prompt availability of scarce information derived from the sources tabulated above means that a lot of material will be of ephemeral interest.

This situation is dealt with by using a second pack of 1,250 capacity feature cards for ephemeral material, which are designated 'E-cards'. Such material is also given separate item cards, with an accession number prefixed by an E. It is anticipated that a pack of E cards will last about 18 to 20 months, after which the entire pack will be stored and a new one used. At present E card input is running at approximately 25% of total input;[†] the advantages of qualitative distinction and prolongation of the life of the main pack definitely outweigh the disadvantage of double searching time in the operating conditions of the ICO.

---

[*] This is obviously not a strict comparison since Fletcher's ratio is based on citation analysis, but is nevertheless interesting. The exclusion of ICO documents, most of which deal with administrative matters, would of course further increase the proportion of journal material.

[†] Main pack input is at present approximately 140 items a month.

Conclusions

At present the INSCOPE term list contains just under 450 descriptors, including names of countries, and a final operational term list should be published towards the end of 1973. Exhaustive testing of the performance of INSCOPE has not yet been carried out on a systematic basis, but the preliminary conclusion which emerges from its performance is that co-ordinate indexing can be used perfectly adequately in applied economics.

REFERENCES

1 United States. Department of Agriculture. National Agricultural Library. Agricultural/biological vocabulary. 2 v. Washington, 1967.
2 JONES, K. P. Basic structures for thesaural systems. *Aslib Proceedings*, **23**, 577–590. 1971.
3 JONES, K. P. The use of links and roles on a pre-co-ordinate basis in optical coincidence systems. *Aslib Proceedings*, 11, 195–199. 1967.
4 KEEN, E. MICHAEL. The Aberystwyth index languages test. *Journal of Documentation*, **29**, 1–35. 1973.
5 FLETCHER, JOHN. A view of the literature of economics. *Journal of Documentation*, **28**, 283–295. 1972.

Adverse drug reaction reports; their storage and retrieval

Michael R. Slater

Information Officer, Hoechst Pharmaceuticals,
Hounslow, Middlesex

There is a statutory obligation for pharmaceutical companies to record reports of adverse reactions to their drugs. The storage and retrieval of these reports, within an operating post-coordinate information retrieval system poses a number of problems due to their multidimensional nature. The use of links and roles to solve this problem is proscribed on economic grounds and so a system, currently being developed, is described using 'generic role indicators' as a primary device for preventing false drops followed by a rapid visual sort using an intermediate file on cards. Considerable time savings have been achieved by the unification of retrieval sources.

Introduction

IT IS a provision of the code of practice of the Association of the British Pharmaceutical Industry that no medical product shall be described, without qualification, as 'safe'[1] and it is widely accepted that no effective drug is without side-effects.[2,3] Ideally, any drug should be sufficiently specific in action that, once administered, it should act at the appropriate site, and that site only, to produce the required pharmacological effect. The dose administered should be sufficient and no more and, after action, metabolised to non-active compounds which can be harmlessly excreted.

Unfortunately, the state of the art is not sufficiently advanced for this ideal of chemotherapy[4] to be achieved, though considering the complexity of the systems involved modern drugs frequently approach surprisingly close to this ideal.

Adverse reaction

An adverse reaction, as defined by the World Health Organisation,[5] 'is noxious, unintended and occurs at doses normally used in man for prophylaxis, diagnosis and therapy'. This is not the appropriate place for a full discussion of the types and incidence of adverse reactions, sufficient to say that they occur to a greater or lesser extent with all known drugs, and are of severity ranging from predictable, slight irritation caused by known pharmacological actions to unpredictable, potentially fatal effects.[2] For the purpose of this discussion, interactions between concurrently administered drugs will be treated as adverse reactions.

The importance of collecting and collating reports of adverse drug reactions is that, by this means, it is possible to obtain prompt warning of the incidence and type of reaction to be expected. It is then possible to alert physicians and pharmacists so that a drug can be withdrawn at the first sign of a serious reaction. This task is admirably performed in the United Kingdom by the Committee on Safety of Medicines (CSM)[6] and on an international scale by the World Health Organisation.[7] Since the institution of the Committee on Safety of Drugs (predecessor to the CSM), and in some cases before, reputable pharmaceutical companies have kept records of drug reactions reported to them. Recently it has become a statutory obligation for the holders of a product licence for a medicinal product to 'maintain a record of reports of which he is aware of adverse effects in one or more human beings or animals associated in those reports with the use of any medicinal product to which the licence relates . . .'.[8]

This recent legal requirement has caused many companies to take a closer look at their existing systems of adverse reaction recording in order to be sure of being able to produce, on demand and at short notice, a record of known drug reactions. This is also of importance when, as occasionally happens, a physician with a suspected case of an adverse drug reaction telephones to inquire whether such a reaction has been previously reported.

The problem

The collection and confirmation of adverse reactions is often a major problem in its own right, involving reports ranging in detail and accuracy from first hand, fully documented case histories to hearsay accounts of reactions in patients receiving many different drugs concurrently.

However, the information scientist's problems usually start at the point when it is decided that a report is sufficiently well documented to be entered into a register of adverse reactions. The reports, originating from physicians, dentists or pharmacists, vary in detail according to their presentation. Unpublished reports usually consist of a file of correspondence, often with one of the company's own adverse reaction forms partially or fully completed and miscellaneous case reports, laboratory findings, etc. Published reports vary greatly in detail; some give full case histories listing reaction, concurrent drugs, doses, whether the reaction subsided on withdrawal of the drug and reappeared with subsequent administration, histological and laboratory findings; alternatively the data may be very sparse such as 'nausea—3 cases'. The latter situation is frequently found in published reports of clinical trials of drugs, with no other detail being given. However, this is still a report of which the product licence holder is aware and must be recorded.

A similar situation is found with regard to secondary publications. There are a number of standard works on adverse reactions and drug interactions, some of which give a fairly detailed account of each reaction and refer to the origin of the reported interaction[9,10] whilst others list reactions with no further detail.[11,12] Some of the secondary publications are arranged by drug,[9,12] some by reaction[10,13] and some by both.[11] Given this diverse collection of reports, arranged in different ways, it is necessary to store them in such a way as to retrieve the appropriate reports to answer specific enquiries, usually on the incidence of a particular reaction with a stated drug. The basic retrieval problem is that of retrieving from multidimensional sources, as illustrated in Table 1.

This classic type of problem is, of course, normally easy to solve using a post-coördinate indexing system, employing optical coincidence cards, or a simple computer retrieval program. However, this necessitates having a completely separate and independent adverse drug reaction retrieval system as well as the existing retrieval system, although some information will be stored in both. It should, however, be possible to achieve this task without duplication of systems and it is this problem which I wish to explore here, together with some tentative solutions including the one being developed within our department.

TABLE 1: *The nature of the sources from which adverse drug reaction reports may derive*

SITUATION	EXAMPLES
Drug/Reaction	
One/One	1. Private report. 2. Letter to journal e.g. 'a case of drug-induced . . .'
One/Many	1. Clinical trial publication. 2. Drug-based review e.g.'the following reactions occurred . . .'
Many/One	1. Symptom-based review e.g. 'this symptom may be a reaction to one of the following drugs . . .'
Many/Many	1. Textbooks. 2. Review of groups of drugs e.g. 'the group of drugs based on this chemical structure may cause the following reactions . . .'

If it is accepted that the major retrieval system used should be able to cope with a register of adverse drug reaction reports, then the situation is immediately complicated by the difficulty of distinguishing, in the system, between symptoms of diseases and adverse reactions. Thus, one item for entry in the system may be a report of a case where a patient with two pathological conditions is treated with three drugs and develops three symptoms of an adverse reaction:

Example

A diabetic, being treated with an oral antidiabetic agent, has congestive heart failure, for which he is being treated with digitalis (to increase the force with which the heart beats) and a diuretic (to treat fluid retention). Due to an interaction between the diuretic and digitalis, the patient develops the symptoms of digitalis overdose, namely headache, nausea and vomiting. Thus we have the following terms:

Disease process	*Drugs*		*Reaction*
diabetes	antidiabetic		nausea
heart failure	digitalis	causative agents	vomiting
	diuretic		headache

Possible entry terms needed to enter report

If these terms are used in the system, the number of false drops obtainable is obviously large. For instance, this item could be retrieved in response to a request for any cases of diabetes being precipitated by the administration of a diuretic, or nausea as a reaction to an antidiabetic.

Possible solutions

One possible solution to this problem is the use of role indicators which show the term relationships. Thus, our hypothetical document would be entered under the following terms:

diabetes (disease)
heart failure (disease)
antidiabetic
digitalis
diuretic
nausea (adverse reaction)
vomiting (adverse reaction)
headache (adverse reaction)

This improves the situation but is still not unambiguous since it does not relate causative agent with reaction. The standard way to relate these would be by the use of links to show the connections between:

1. Diabetes and antidiabetic.
2. Heart failure, digitalis and diuretics.
3. Digitalis, diuretics, nausea, vomiting and headache.

One way of achieving this is by giving the document three item numbers in the system and enter as three documents 1, 2, 3 as above. There is an economic objection to this solution. Previous investigations have suggested that the increase in indexing time and inherent limitations of links and roles make their use economically unsound.[14]

The use of roles alone will obviously lead to a large increase in terms of the system, since every disease entity which can also occur as an adverse reaction will then require two terms and there are likely to be a large number of these terms even using fairly broad headings; our optical coincidence system (BfD Sichtlochkarte) at present lists in the thesaurus over one hundred terms which are likely to be used for adverse reaction descriptions and we have no wish to double this by the use of role indication.

What we have done is to use a method of 'generic role indication' which effectively prevents many of the false drops whilst only increasing the controlled keyword vocabulary by nine terms.

Each report item is entered using the terms shown, e.g.

diabetes	diuretic	nausea
heart failure	digitalis	headache
	antidiabetic	vomiting

and, in addition, to show that it concerns an adverse reaction of a specific type it is also entered under the appropriate generic adverse reaction role indicators, e.g. adverse reactions (gastrointestinal) for nausea and vomiting and adverse reactions (nervous system) for headache term. Thus, anyone searching for cases of diabetes caused by diuretic agents would use: diabetes, diuretic, adverse reactions (metabolic) and would fail to retrieve this irrelevant item. Obviously, where this system falls down is when two drugs may cause similar adverse reactions, e.g. antidiabetic, adverse reaction (gastrointestinal), nausea would retrieve this item as a false drop.

However, these are quickly detected on an intermediate file which consists of cards (A5) filed by item number. These cards have the advantage that additional files are easily produced by photocopying (two A5 cards on one A4 sheet of photocopy paper). The cards can be arranged by author, product or adverse reaction and used to make extra sets for enquirers. Each card has on it the item retrieval number, author, reference, abstract and a number of keywords (for personal communications the references will be, e.g. Unpublished Report no., product/year/number). The keywords listed can be cited in an order where the role immediately follows the drug to which it relates, e.g. diabetes : antidiabetic : therapeutic use : heart failure : diuretic : digitalis : drug interaction : adverse reaction (gastrointestinal) : nausea : vomiting : adverse reaction (nervous system) : headache. Abstract, title and the keyword citation order enable false drops to be quickly eliminated before referring to the original item and in practice, all irrelevant items are discarded at this stage although the possibilities inherent in regulation of the citation order have not yet been fully explored.

Conclusion

In this account I have briefly looked at some of the problems involved in storing and retrieving adverse drug reaction reports and some possible solutions including the system which is at present being developed in the Technical Information Department at Hoechst Pharmaceuticals. At the moment our system seems to be working, with most items concerning our own products being retrieved by means of the intermediate subject file, whereas items about products not marketed by us are usually retrieved by the optical coincidence system. One factor which seems to aid its success is our decision to include adverse reaction data from all sources in the same system. That is, rather than having separate correspondence files and secondary publications to be consulted, all references to drug reactions to our products, in the UK or overseas, are listed in one place and if it is not there, we do not know about it. This alone achieves considerable savings in search time.

I should like to acknowledge the skilled assistance of Miss M. H. Buckingham in the preparation of this manuscript.

REFERENCES

1 ASSOCIATION OF THE BRITISH PHARMACEUTICAL INDUSTRY. *Code of practice for the pharmaceutical industry*, Revised Third Edition, February 1969.

2 INMAN, W. H. W. (1970) The study of adverse reactions to drugs. *Proceedings of the Royal Society of Medicine*, 63, 40.

3 Editorial (1971). Drug reactions. *Lancet*, i, 1227.

4 BÄUMLER, E. (1965). *In search of the magic bullet.* Thames and Hudson, London, 1965.

5 W.H.O. (1969). *International drug monitoring.* World Health Organisation Technical Report Series No. 425, Geneva.

6 INMAN, W. H. W. (1972). Monitoring by voluntary reporting at national level. In· *Adverse Drug Reactions*, ed. D. J. Richards and R. K. Rondel. Churchill Livingstone, London, 1972, p. 86.

7 ROYALL, B. W. (1972). International coordination of the monitoring of adverse drug reactions. *ibid*, p. 131.

8 Medicines (Standard Provisions for Licenses and Certificates) Regulations, 1971. S.I. No. 972, Schedule 1, Part 1, 4. H.M.S.O., 1971.

9 MEYLER, L. and HERXHEIMER, A. eds. (1972). Side effects of drugs. *Excerpta Medica*, VII, 1972.

10 MARTIN, E. W. (1971). *Hazards of medication.* J. B. Lippincott Company, Philadelphia, 1971.

11 WADE, O. L. (1970). *Adverse reactions to drugs.* William Heinmann, London, 1970.

12 COMMITTEE ON SAFETY OF MEDICINES (1971). Edited and selected abstracts from the register of adverse reactions. Department of Health and Social Security, London, 1971.

13 MEYLER, L. and PECK, H. M. (1968). Drug-induced diseases. *Excerpta Medica*, 3, 1968.

14 TAUBE, M. (1961). Notes on the use of role and links in coordinate indexing. *American Documentation*, 12, 98.

The London Classification of Business Studies

TOWARDS A REVISED EDITION

K. G. B. Bakewell

Senior Lecturer, Department of Library and Information Studies, Liverpool Polytechnic

A review of a one-day seminar held at the London Graduate School of Business Studies on 4 April, 1973

The London Classiffcation of Business Studies (LCBS)[1] has now been published for 3 years and is used by at least 17 British and 11 overseas libraries. Twenty-eight users might not seem a great many, but for a specialist scheme it really represents a significant impact. The first impression of 400 copies was sold out within a year, and 200 copies of the second impression (June 1971) had been sold by the end of March 1973. It is reasonable to suppose that these 600 copies are having some influence on the organization of business literature throughout the world, and that more libraries are considering adopting LCBA than the six known to the London Business School.*

In April 1973 a seminar for users of the scheme was held at the London Graduate School of Business Studies, the purposes of which were to allow users to discuss matters of mutual interest; to consider expansions and amendments which have been made to the scheme and the desirability of making further modifications; and to consider what steps, if any, should be taken towards the preparation of a second edition. In his introductory remarks Ken Vernon, Librarian of the London Business School, quoted Derek Austin's reference to the scheme as a 'well-articulated skeleton';[2] the purpose of the seminar was to decide how to clothe it with more flesh.

Short papers were presented by two users of the whole classification, Jill Sheppard (Polytechnic of Central London, School of Management Studies) and Sheila Duncan (Manchester Business School) and by representatives of three organizations which had made substantial revisions or expansions to parts of the classification: Valerie Lang, Andrew Pates and Rohan Bolton (Institute of Manpower Studies), Deirdre Gill (Institute of Personnel Management) and Bridget Howard (Civil Service Department, Central Management Library). Christine Rowat described an interesting experiment at Cranfield Institute of Technology, where LCBS is used for the arrangement of books on the shelves and the Blagden thesaurus[3] for the subject catalogue. A library school view was presented by Ken·Bakewell and Mary Allchin, both of Liverpool.

---

* It would be helpful if libraries which are using the scheme would notify the Librarian of the London Graduate School of Business Studies, Mr K. D. C. Vernon.

There was remarkable unanimity among the speakers about one point: LCBS may have faults (generally minor ones), but it *works*. Jill Sheppard had found it 'an excellent working tool' when reclassifying the Polytechnic of Central London's School of Management Studies Library from Dewey; she had come across very few problems, and this was perhaps the reason for the lack of feedback on the scheme.

But some problems there undoubtedly are. What is the literary warrant for the differentiation between industrial relations (FK, under Personnel) and labour relations (JWL, under Economics)? Why should costs and costing (JE) be so widely separated from cost accounting (ELBB)? Why is there no place for appraisal interviewing (or interviewing in general), for flexible working hours, or for job attitudes? Why were some industries deliberately omitted from Class K (Industries)?

Some users felt that the subject index needed to be expanded and should include some synthesized terms. Others disliked the preferred order recommended for synthesis, and some disregarded this completely. One person who does follow the preferred order rigidly is Mary Allchin, whose research at Liverpool Polytechnic involves the comparison of LCBS with the Universal Decimal Classification, a feature card index and a computer-produced KWAC (Keyword-and-context) index. In a test situation Mrs Allchin felt that she should use the scheme exactly as it stands, and she has been irritated by aspects of the preferred order: for example, firms in particular industries (at AZA synthesized with K) are frequently separated from the industry itself (at K). (Considerable interest was expressed in Mrs Allchin's research, which has so far involved the indexing of seven hundred periodical articles. She is now engaged in a comparison of the retrieval of these articles by the four indexing methods and at the end of her research we should have some very useful information on the performance of LCBS.)

The hierarchical notation was criticized by a number of reviewers of the scheme when it was first published, including the present writer, and the Manchester Business School abandoned it from the very beginning in the interests of shorter notations and greater hospitality. However, Sheila Duncan pointed out that this is causing some difficulty as users of the library *expect* a notation to be hierarchical. (Mrs Duncan also mentioned that the Manchester Business School is computerizing its catalogue, and it is worth noting that hierarchical notations do have advantages in computerized retrieval.) A suitable compromise has perhaps been achieved in Valerie Lang's expansion of certain areas of LCBS for use in the Institute of Manpower Studies Library, which was presented for discussion at the seminar. The notation is hierarchical until the point is reached where three or four digits would be exceeded; a 'brake' is then applied, and ordinal notation is adopted. For example:

F	Personnel
FB	Recruitment and selection
FBC	Recruitment
FBF	Selection procedures
FBG	Appointments Boards

FBH	Job requirements
FBJ	Physical and mental capacity

The Institute of Manpower Studies classification draws heavily on the revision of the Bliss Bibliographic Classification, on which Miss Lang has been working with Jack Mills of the Polytechnic of North London's School of Librarianship. This is good: why should we duplicate work which has already been done satisfactorily? A disturbing feature at the seminar was that already a number of organizations have made their own 'private' adaptations and expansions to LCBS: two libraries, for example, have decided to classify information retrieval at the vacant class Y, each producing their own schedules. It was decided at the seminar to set up a small working party to consider the possibility of a clearing house to receive and co-ordinate information about future amendments to the classification, thus achieving some degree of standardization.*

It was also decided, by a small majority of those present, that there should be a revision of the scheme rather than the issue of a new edition with minor amendments, but that this revision should be kept within reasonable limits according to the needs of users. Some classes would need little attention, others would require considerable expansion while retaining their basic structure. A third group, consisting of classes AZ (The Enterprise), E (Finance), L (Behavioural Sciences) and Q (Political Science), would need complete revision as they have not proved satisfactory in their present form. It was agreed that the index should become a thesaurus; dare we hope that, in spite of their slightly different scope at present, the second edition of LCBS might also be a third edition of Blagden's *Management Information Retrieval*?

'A good classification scheme, like a good bidding system at bridge, should never be stable', wrote Stuart-Jones in 1969.[4] I do not play bridge, but I certainly agree with Stuart-Jones about classification. The willingness of the compilers and users of LCBS to come together, pool their ideas, and draw up plans for further developemnt of the classification must be welcomed by all who are interested in business and management studies. Knowledge does not stand still, especially in an area like business studies. Reclassification, as was observed at the seminar, costs time and money. It is, however, more costly not to reclassify if this means that the users of the information service are denied the benefits of a satisfactory retrieval system.

REFERENCES

1 VERNON, K. D. C. and LANG, VALERIE. *The London Classification of Business Studies*. London: London Graduate School of Business Studies, 1970.

2 AUSTIN, D. W. *Journal of Documentation*, 27, no. 1, March 1971, p. 58.

3 BLAGDEN, JOHN. *Management Information Retrieval: a new indexing language*. Rev. ed. London: Management Publications, 1971 (1st ed. 1969).

4 STUART-JONES, E. A. L. *Education Libraries Bulletin*, no. 36, Autumn 1969, p. 16.

* This Working Party is now in existence and has held its first meeting. Known users of the classification will be supplied with preprinted forms to assist them in submitting amendments and queries.

Letter to the Editor

MEASUREMENT OF COST BENEFIT

Dear Sir,

The May issue of *Aslib Proceedings* contained one of the most detailed articles I have yet seen on the measurement of cost benefit in information centres.[1] It clearly demonstrates that it is possible to apply this method in a library/information environment. However, there are two aspects of this technique, and many of the other modern management techniques that are becoming fashionable, which need to be watched very carefully.

The first is that the introduction and application can be labour-intensive. Extra administrative responsibility in recording, planning and implementation is called for. More meetings to plan the introduction of the new approach and more meetings to ensure that it is being carried out as planned; more time spent in recording the time taken to carry out work; and finally more senior staff time in analysis. It is rarely possible for implementation to take place without additional staff or staff who are so dedicated and so enthusiastic about the new methods that they are willing to work excessive hours.

The second point is perhaps even more important. With few exceptions these techniques attempt to provide an existing service in a way which can be demonstrated to be more effective and sometimes cheaper. Unfortunately, higher management are often more attracted to the latter rather than the first of these reasons. The danger is that existing methods and procedures will become embedded in a new overall system, when what is really needed is a complete overhaul, restructuring or replacement of the old methods.

This letter may appear completely destructive. It is not meant to be. It is a plea for an order of priorities:

1. Carefully examine all your existing methods to see if they can be streamlined without loss of efficiency.
2. Assess the value to your operation of the various new techniques available.
3. Assess the amount of extra staff time needed to implement your decision and check carefully that extra staff time will not be needed to run it once implemented.
4. If extra staff are involved make sure that your management are prepared to provide them.

Yours faithfully,
F. H. AYRES
Deputy Librarian

University of Bradford,
Bradford,
Yorkshire BD7 1DP.

---

[1] MAGSON, M. S. Techniques for the measurement of cost benefit in information. *Aslib Proc.*, **25**, 164–185, 1973

BRIEF REVIEWS

ABBREVIATION AND ACRONYMS IN SCIENCE AND TECHNOLOGY. English-German. Wiesbaden: Brandstetter, 1972. 726 pp. £4.50. (ISBN 3 87097 051 0)

This compilation sets out to cover systematically British and American abbreviations and acronyms in particular areas of science and technology, including mechanical engineering, chemistry, electronics, aeronautics, civil engineering, surface coatings, mathematics and physics.

It lists abbreviations with their full forms in English plus their German translations, thus also fulfilling the role of a translating dictionary. Some 16,000 abbreviations and acronyms are included in alphabetical order, with capital letters before those in lower case, and unpunctuated abbreviations preceding those which contain punctuation marks. Where two or more English meanings of an abbreviation are given, they are also in alphabetical order. Where the abbreviation is of a body, its name is given in inverted commas.

The loose-leaf format is to facilitate corrections and amendments: it is hoped to issue updating leaves from time to time; the first are scheduled for 1974, and the whole publication promises to be a very useful reference work.

BIBLIOGRAPHIC INFORMATION. The Labor movement, Marxism, Socialism, Revolutionary and Liberation movements, Third World. Zürich, Limmat-Verlag, 1973. 68 pp.

Towards the end of 1972 the International Association of Labour History Institutions took over the publication of *Bibliographische Information,* a periodical providing bibliographical details of books on the labour movement, Marxism and Socialism, revolutionary and liberation movements, and the Third World, published in German, French, Italian and English. Issue no. 14, 1973 was the first issue to carry details of books published in the U.K. The details are contributed by librarians of the Association, the British contact being Mrs. Irene Wagner, Secretary of the I.A.L.H.I., and Librarian of the Labour Party at Transport House, Smith Square, London, SW1. The periodical attempts to be quarterly, and in issue 11/12, July 1972 was a keyword subject index (in German) to issues 1-12. For details of this and advertising and subscription rates, contact: Limmat-Verlag, Froschaugasse 7, 8001 Zurich, Switzerland.

BRITISH UNIVERSITIES FILM COUNCIL. Audio-visual materials for higher education. London: British Universities Film Council, 1973. 222 pp. £2.75. (ISBN 0 901299 05 7)

The tracing of non-book material is difficult, particularly for these who are not skilled in the art. The third edition of this publication including not only films as did the earlier editions, but also video tapes, tape-slide programmes and sound tapes will prove very useful, intended as it is for teachers in higher education. Inclusion in this catalogue implies the material has been used or recommended for use in degree teaching or research. Most entries carry a synopsis which has generally been supplied by the distributor. In certain instances the comments of the appraisers have been used to amend the synopsis; appraisers are listed at the end of the publication with their affiliations.

Each entry includes title, country of origin, distributor, availability, year of production and producer, besides other details such as running time. Entries are arranged by UDC with explanatory headings. The publication has a title index, a subject index and an alphabetical listing of the names and addresses of distributors.

The compilers of the catalogue have not attempted to list material that is well catalogued elsewhere, instead in Appendix 1 the details of various useful catalogues are given with an indication of coverage. Appendix 2 includes a sample appraisal form and users of audio-visual materials are invited to make contributions or recommendations. This publication should prove a very useful guide to all those who are concerned with tracing audio-visual material.

DOE. Annual list of publications 1971. London: Department of Environment Library Service, 1973. 119 pp. (ISBN 0 903197 09X)

At last, out of the muddle of government publishing, a brave light shines in the gloom. The Department of the Environment Library Services has seen fit to bring together under one cover a list of all publications 'which are of more than local interest and available to the public, which were issued by the Department of the Environment in 1971'.

Anyone who has searched for a listing of Road Research Laboratory Reports or tried to track down the reports issued by the Mathematical Advisory Unit will be familiar with the tangle of those publications not produced by HMSO. This list ably fulfils the need for bibliographical control over the host of material issued by separate divisions of the Department. It is divided into eight sections according to the type of publication being listed or the publishing authority. Each section is further subdivided according to subject headings detailed at the beginning of the list. The list is completed with separate indexes to authors, issuing agents and subjects giving direct reference to the running number of the relevant item within each section.

Of course we can never be sure just how comprehensive the listing is, nor do we know just how a 'publication' is defined in order to be included, but certainly we have never seen such a full listing before, and if the promise of the preface is fulfilled we will be very happy to see its successors. Wouldn't it be wonderful if a few other departments were inspired to take up the challenge!

BROWN, CLARA D. Serials: acquisition and maintenance. Birmingham, Ala., Ebsco Industries, 1972. 207 pp. $4.95

This is a down-to-earth manual describing the main procedures in a fairly large Serials Department, excluding cataloguing. Assuming a background of American practice it provides a wide range of useful hints and advice, including detailed examples of the record forms, etc. It contains a chapter describing the main library tools that are relevant, a bibliography and an extensive index.

INTERNATIONAL BIBLIOGRAPHY, INFORMATION, DOCUMENTATION (IBID), V. 1-, no.1-, March 1973- New York, Bowker and Unipub, 1973.

Since 1963 when the UN Documents Index (UNDI) no longer included the publications of the Specialized Agencies there has been no single current bibliography for the whole UN family. Bowker in its new quarterly service IBID is now aiming to close this gap. The Editor is H. N. M. Winton, formerly Chief of the Documents Reference Section responsible for producing UNDI from the UN Library in New York. Each issue contains 3 parts: 'Information and news' with background material on the organizations themselves; the 'Bibliographic record' giving references with brief annotations of all the non-serial priced publications in broad subject arrangement (38 subject headings); the 'Periodicals record' listing tables of contents of the periodicals, arranged in the alphabetical order of their titles.

Library Removals start here

In Bullens planning office
Every move is planned in detail,
problems of access or timing overcome,
men, vehicles and equipment allocated –
well before the move begins.
So you move safely, quickly and with least disruption.
That's the difference between Bullens
and any other contractor.
Phone today.

Bullens
TRANSPORT SERVICES
Bullens Transport Services Ltd
408, Hornsey Road,
London, N.19 4EB
Tel. 01-272 6671

Also at Bristol, Hinckley
and Newton-le-Willows.

A Gillespur COMPANY

FIRST for carpets
Dodson Bull

UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display

In our extensive London and provincial showrooms
Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7871
BIRMINGHAM: 184 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 68402
BRISTOL: 2-3 Royal London House, Queen Charlotte St
BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LQ.
Tel: Southend 46569
9.00-5.30 Mon.-Fri. Sat. 9.00-12.00 (Manchester 9.00-4.00)

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\begin{Bmatrix}\text{specific}\\\text{recent}\end{Bmatrix}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

unilever research

Assistant Librarian

A good opportunity exists for a young chartered librarian, preferably with some scientific training, or alternatively a graduate with experience of scientific and technical library or information work.

The Assistant Librarian is required to be responsible for planning library systems and for the use of computer techniques in the library. In addition, he or she will help in carrying out surveys of library use and in classification and cataloguing. The work will involve travel to the Welwyn Laboratory (Hertfordshire) for an average of one day per week. Interest in the application of systems analysis and computer techniques in library operations is important. Some experience of cataloguing scientific literature would be useful, although not essential. The ability to recognise, analyse and solve problems is necessary.

Colworth House is situated in a pleasant country estate ten miles north of Bedford and is responsible for the research relating to Unilever's world-wide interests in the food industry. A good starting salary with annual merit review and good employee benefits will be offered to the selected candidate.

Interested applicants should write for an application form, quoting reference CWA.159, to:

The Personnel Officer,
Unilever Research,
Colworth/Welwyn
Laboratory,
Colworth House,
Sharnbrook, Bedford.

Bibliographies are the librarians' primary aids . . .

LIBRARY ASSOCIATION BIBLIOGRAPHIES INCLUDE:

Bibliography of the dog. E. C. Jones. £12 (£9.60 *to members*)
London theatres and music halls, 1850–1950. Diana Howard. £4 (£3.20 *to members*)
Bibliography of nursing literature. A. M. C. Thompson. £4 (£3.20 *to members*)
Bibliography of film librarianship. Sam Kula. £1 (£0.80 *to members*)
Serial publications in the British parliamentary papers. Frank Rodgers. £2 (£1.60 *to members*)
Steam locomotive development. Kevin Jones. £2.25 (£1.80 *to members*)

Write for our Publications List to:

THE LIBRARY ASSOCIATION,
7 Ridgmount Street, London, W.C.1.

A new tool to help you build and manage science journal collections

If you are in charge of any general or special collection of science journals, the *Journal Citation Reports* can play a valuable part in making your collection more useful to the reader and more manageable for you. *JCR*™ can help you

. . . prove the relative usefulness of each journal in your collection

. . . select the most used journals in any scientific discipline

. . . identify lesser known journals of proven value in a given field

. . . accurately judge how long scientists find a particular journal's issues useful

. . . identify journals from other disciplines which are related to your readers' primary journal interests

This new service provides carefully selected statistical evidence to help you judge the usefulness of individual journals and the effects of time on the value of published journal articles. It will help you to better understand the patterns of relationships between journals and ways scientists use, read and refer to them.

Once you've gotten the full story on *JCR* you'll see quickly how you can use it to determine the optimum makeup of special and general journal collections as well as the size of journal back files. You'll see how you can use it in managing subscription budgets, in developing journal circulation and photocopying policies and in a myriad of individual ways you can tailor to your own interests and needs.

To obtain the full story on the many uses of *JCR* and complete pricing information, please use the coupon below.

ISI
JOURNAL
CITATION
REPORTS™

©1973 ISI

Please send me full information on
Journal Citation Reports.™

Name ____________________

Title ____________________

Organization ________________

Street Address ______________

City ____________________

State ________ Zip ________

Country __________________

Telephone _________________

isi®
13-300

Institute for Scientific Information
325 Chestnut Street, Philadelphia, Pa. 19106
U.S.A., Tel. (215) 923-3300

22 MAR 1974

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib Proceedings

PROMOTING [illegible]
AND INFORMATION [illegible]

Justification of information services [illegible]

Information services in industry [illegible]

Public relations: the soft sell [illegible]

Education and training: for staff and users [illegible]

Publicity or selling the information service [illegible]

A device for recording the process and [illegible]
punched files Dr. G. E. [illegible]

OCTOBER 1973
VOL. 25, NO. 10

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of { specific / recent } information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

Aslib Proceedings

VOLUME 25 OCTOBER 1973 NUMBER 10

© 1973 Aslib and contributors

Aslib Proceedings is *published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

Justification of information services

R. D. Gee

Senior Information Adviser, Kingston Polytechnic

Paper presented at the one day conference on Promoting Industrial Library and Information Services, Royal Aeronautical Society, London, 4th July 1973

OF ALL the speakers today, I think I have the easiest task, since I have to set the stage for justifying information services faced with the widespread problems with which you must be familiar—otherwise you would not be here. It is not for me to conjure up the ideal system, the short or long-term solution, or the methods which will overcome the sometimes intangible problems. It is merely for me to state some typical problems as a framework for the thoughts of the day. I cannot even promise to mention them all, and hope your discussion will correct my omissions.

I also have the advantage that I no longer wear a company hat, so I feel free to share my experience without jeopardizing my future. It may also be relevant to add that I represent one of your problems—the external service that may attract the attention of your management away from your internal service. However, I hope you are clearly aware from the outset that I know that a broad-based external service is no substitute for an internally tailored specialist one. You know this. I know this. Unfortunately, sometimes, your managements don't, and often play you off against us to your cost.

This leads conveniently to the first need to justify your services, and one of your motives for publicity—that is to offset the competitive services operating outside your company that your own short-sighted management may prefer to support rather than you.

The other motives, which do not need detailed expansion because I'm sure they speak for themselves, are:

Protection of employment, and self-advertisement perhaps for the service, but equally likely as a contribution to personal ambition—and a weapon for in-company competition for the bosses' favours;

Altruism and reluctance to see your abilities and resources wasted;

Increase of department budget, status, and job satisfaction.

How do these personal reasons for propaganda compare with the accepted corporate marketing exercise? Without analysing the overwritten texts of salesmanship, one could simply state that the so-called science of marketing has two extremes. On the one hand is a product that no-one wants, but expert manipulation can convince them otherwise. This product need not be as trivial as plastic flowers, or cardboard breakfast food—but may be as complex as a national commercial alliance, as remote as a supersonic airliner, or as incomprehensible as a new form of taxation.

On the other hand is a product that, in truth, needs no marketing effort, but gets it anyway—to such an extent that the bush gets the glamour although the wine is well-capable of standing for itself. Sales promotion departments need self-justification, too.

The word has not been used in the publicity for this meeting today. I do not recall it in our initial planning committee discussions. But we must defer to its existence. I refer to *Advertising*.

In between the marketing extremes rather cynically noted before, there is the majority effort expended on 'brand imaging'. I do not wish to disappear into an empty quasi-academic glossary of terms like 'Word of mouth', 'Point of sale', 'Motivation', 'Opinion leadership', 'Life-style categorization', or 'Pre-decision behaviour'.

I only raise this aspect to remind you of one terrible millstone. If you work for a producing industry, sales-oriented, and driven by the modern concept of total advertising—then all your efforts of justification, propaganda, and gospel-strumming will, in the end, be directed at people who believe that their very existence relies on the advertising machine. Against the very techniques to which your own company devotes vast resources to part the customer from his money, your efforts will look puny indeed.

The man who agrees to spend a few £m on convincing a sceptical world that they have a tiger in their petrol tanks has been so brain-washed by advertising methodology that he cannot recognize honesty and the altruistic desire to serve. All he can recognize is advertising when he sees it. And he distrusts it all.

He, whether a corporate 'he' or an individual 'he', is a pawn of the merchandising ethos—and *you* may become a brand when you start publicizing.

If I were to try to point a finger at the underlying cause of all the problems associated with this conference, it would be towards the self-deception of dissolving images that allows corporate thought to believe anything it writes but nothing it reads.

The dilemma is readily stated—but rarely solved. If you opt for the glossy techniques of the company's external image to keep up with all the internal competitors for paternal attention, you will be seen to be as shallow as them and you will have reduced the odds in your favour. Eventually your self-deception will catch up with you. If you sensibly reject such prostitution, and rely on honesty, service and hard work—you probably won't get to first base. The position can only be played by ear, which is why the Vicar of Bray is such a paragon of reality. It sounds a terrible piece of advice to give—but if you wish to continue to work for unprincipled people, why be the odd one out? Once you have taken a path dictated by ambition, you begin to forsake ideals. Survival alone, I suspect, is sufficient.

If you think this reeks of the cynicism of the grey flannel suit, you are right. William Whyte's 'Organization man' tells us that in corporate psychology it is not the job that is measured, but the person doing it. They don't care about your *function*. The strangest compliment I received was when I was told that I was wasted in the library—and promptly promoted out of it. At least, I think it was meant as a compliment!

The people you are trying to impress with your service cannot believe that you are selling anything other than yourself. From the library standpoint it is therefore a dangerous view to accept those carrots that appear to lead you towards executive glory. You would only be allowed to be managing director if it was felt that you would behave like all the others.

Since the success of an industrial information centre relies on the personal attributes of its chief practitioner, it is very difficult to aim for promotion of the department itself. This enigma is discussed at length in a book the title of which has become a household phrase in management literature—'The Peter Principle'. This alludes to the continual promotion of people until they are forced into the level of their own incompetence—and is a perfectly serious statement about the misconception of rewards in industry.

I would now like to move the problem down the line a little and consider briefly the difference between a company whose information services are part of an overall corporate cost, and one in which the unit is part of a division charging for its services. This is such an important bifurcation that its existence pre-empts any attempt to generalize your problems. In fact, you will have noticed that in order to generalize anything I have to reach into the sublime.

It is in a company wherein neither the information department nor its divisional parent charge for its services that I think some of the worst problems lie. The unit becomes equated with management service functions like accounting, data processing, or purchasing—and when coats get cut according to cloth, you feel the scissors first. No amount of publicity will allow you to compete against departments whose objectives are short-term and can justify their existence in a short-term crisis. In this type of situation it is readily seen that any attempt to justify your existence spends the very money they are trying to save, and executive management is not going to be too happy with departments scattering company money in order to protect themselves from the company. As far as they are concerned, you are not in what they see as the front line of producers or salesmen.

In the second situation, where the information unit contributes to company services receiving an earned income, I think the unit's troughs will not be so low—but its peaks will not be so high, as in the first case. The information officer will also probably have greater freedom in his budget for his stock selection, staffing and productions. I have never met anyone in this second environment who has had the details of his professional judgement challenged, but I believe that it is quite commonplace in the situation where a library runs on common company overheads.

In an R & D or Marketing Services division, the library is often recognized by its immediate users as a point of contact with other divisions. It can suggest to its own masters potential divisional customers made apparent from an incoming enquiry—and can sniff out some of the odd odours of interdivisional warfare. Library publications in this environment are not only well-received within your unit, but are accepted as part of the divisional propaganda. Unfortunately, however much your boss believes in you, and even if he has transmitted your arguments upwards, you rest your faith on the vulnerability of the whole division. You may even find him exploiting you for his own survival, since we all know how many people in this world consider themselves eminently capable of making instant decisions about research and development activities.

Whether it is easier or more satisfying to work for a company or a division depends on the company and its divisions. I am aware that I cannot just create two states and assume that each of you is in one or the other. There are profiles that do not fit because their definition is so low that they will not be represented here—and there are those who are so close to Utopia that they have no problems to share with us. However, long-term solutions and the ideal for which we should aim must be left to the next speaker. I'm here to attempt to identify some specific problems so that a general canvas can be filled in by the others.

I would now like to create another bifurcated generalization, leading to a classic example of Morton's Fork (or in contemporary terms, Catch 22). It is possible that there are two ways of looking at the reason behind, for example, an abstracting service. One purposive view is that the document is the information service, and all expenditure on subscriptions, purchases, furniture and staff is to feed the beast. In which case your stock is revenue and the reason for your existence is the awareness product.

Another view is that the publication is a means of drawing attention to your resources, in which case the stock is your capital asset. One might see this simplistic statement as the difference between an information officer and a librarian, but since I think you end up wearing both hats, I have not introduced this comparison in order to rub old sores. In fact, you invariably start with one philosophy and find yourself moving steadily towards the other.

Let me now invent two company accountants. The first one, Mr Overfrugal, under a natural inclination to close his fist, looks at the service resulting from the first view. He sees a product that has no reason within his experience. All he needs to do is to challenge its existence and once he has used this power successfully, *ipso facto,* the expenditure must cease. And its perpetrator . . . The second accountant, Mr Scruple, has had his attention drawn to the document created by the second philosophy. His natural suspicions tell him that anyone spending company money to justify his expenditure must be an apologist, and therefore the obviously overgenerous budget must be cut.

Although this is Morton's Fork, perhaps one tine is not equal to the other? It is possible that the librarians survive, but information officers do not. Perhaps someone would care to comment in the discussion later?

For those who may wish to consider this aspect in discussion, while avoiding the conflict of whether we crack our eggs at the thin end or at the thick end; or that *we* are white animals with black stripes, while *they* are obviously black animals with white stripes, I offer the following observation:

> Libraries, by definition, are quantitative and tend to grow. They tend to become protected collections with only a portion of resources visible and even units that began as clearing houses of current intelligence develop this shape in time. It becomes imperative to exploit the now less topical resources, before they are removed on the grounds of false economy.
>
> Information centres, operating only as news services, will tend to restrict

their consumption of space and reject all input once it has been exploited by the outward-looking service.

While it seems simple to state the difference as one between introspection and extroversion, whatever end of the spectrum we started at, we tend to move towards the other. Like Mrs O'Grady and the Colonel's lady.

Although I stated a reluctance to re-open the empty debate of librarians versus information officers, it is clear that the differences that do exist are nothing to do with individuals but the structures that surround them. Once the stature of *library* is achieved, a dynamic self-assertive attitude becomes unnecessary, since the users will defend your existence to the shreds of the last banner. The organism has little need to be more than passive. When all the propaganda from information departments has succeeded, the same climate will apply, and complacency will creep in as the services are taken for granted. I suspect that the constant fight and frustration is in fact important. Its existence creates the dynamism from which the most effective services pick up their drive. Can you retain the finest edge to your services when you become everyone's friend? Perhaps management is aware that the best performance is not produced by the over-nourished fighter—although I agree that starvation does not win many Lonsdale belts.

The preceding observations serve to underline once more the vital warning—that before embarking on any dynamic service you must be clear in your mind of both the motives and the purposes behind your venture in relation to discernible company needs. This point of fine balance will be developed by another speaker.

I think the areas I have covered so far can be loosely labelled *motivation*, *function*, and *purpose*. There is another facet of the rather crudely cut stone to consider, and in structural terms it should probably have preceded the other three, because it dominates the attitudes of every employee from top to bottom. I refer to the overall approach of the company. I won't go into the detail of the differences beyond those of an organization being production-based, with those that are marketing-based, or service-oriented. There are several ways of recognizing which emphasis the corporate mind subconciously prefers. The company's house-journal invariably gives the game away over a period of time by subtle emphasis on certain activities, and suspicions once aroused can be confirmed by a study of the background of promoted personnel. To put it simply, if all senior executives started as salesmen you are in an arena very different to one in which they were once in production. It is although worth noting how quickly accountants appear to rise. Merger impositions apart, it is probable that once a company has evolved a promotion pattern, it will keep to it—in perpetuity. It is this factor that makes one company different to another, although the product itself may influence the pattern. However with today's conglomerates, diversification, and abstract product lines, the end-product as a definable entity has possibly become a thing of the past. I will offer more parameters of interfirm comparison as a summary at the end of my paper.

Incidental to the promotion pattern, and the shape of the faceless engine to which you are continually attempting to add doses of upper-cylinder lubricant, is the genesis of the company. Although you will doubtless see yourselves as individual exceptions, I claim that there is a difference between an American company and an indigenous one. There is sufficient evidence to indicate that an American head-office plays its cards very close to its chest, and that it is not a typical one that allows full promotion and consultation to its British limbs. No American company will allow its London office to be more powerful than its home directorship, particularly if its shares are not quoted on the London stock exchange. Perhaps future company law may change this position, but such a probability is outside my presentation. If the profits go back yonder, then uneasy lies your head. If the British subsidiary makes a loss, then a very long-handled axe is wielded and changes made. If it makes too good a profit, then the British chair, or any other position, becomes an enviable reward for someone closer to the family circle.

The most sensible thing for a British company taken over by an American to do, may be to make only a slight profit. American branches established from scratch are another situation altogether, but in library terms, the word *branch* is the operable problem. It is not too uncommon a part of the Hollywood imagination when the hero is given the London office to run, and although I am aware that some American companies go to great lengths to keep the natives happy, not many natives become vice-presidents.

This diversion may seem a far cry from the theme of this conference, but I know of one library rotting in a Marylebone basement because Ohio ordered a 30% chop of the London staff. And even the highest ideals of library service and publicity were powerless to prevent it happening, although it must be admitted that the detail of the 30% was in London hands.

There is a factor in corporate differentials which is stubbornly overlooked by those managements whose decisions are based on simple and mechanistic accountants' arithmetic. It seems to apply in such services as R & D and information, but is applied conversely in advertising. This factor is that of *market percentage.*

Imagine a hypothetical situation in which 10 companies compete for equal shares of a market in which 50% of it is held by an 11th company. This is not untypical of IBM in many countries in which it operates. In this simple model managements of the small-share companies all argue from the same fallacious standpoint. For example, for every £100 spent on information by the large-share company, they insist that they should only spend £10. What they fail to understand is that in a given field of technology, computers for example, the situation should be reversed. Of all published computer literature, it is likely that the *contribution* of IBM's staff matches its proportion of the market. Not only has IBM already bought such knowledge before it has been published, but it indirectly gains income from the sale of it. Therefore to enable each competitor to have equality of knowledge with the market leader, it must spend proportionately *more* than the market leader.

But what does the small-share company do? It increases its advertising budget because it believes that x% of brand expenditure automatically brings in x% of the market. It pays for this by reducing expenditure in areas where the ratios should be in inverse proportion to the market share. The net result is that the IBMs of the world retain the lion's share and the small share companies remain the runts.

This *information factor* is sadly lacking from most managment and marketing games. I have now shed enough terror and bewilderment to move to my fifth area—which is hopefully more practical and related to what is not beyond you. In selling terms, I mean the prospect, or your target. Whom are you to aim your weapons at? Since we know that merely serving the client does not guarantee the client of continued service, it may be useful to categorize the likely recipients of your hot gospels:

(1) Those above you totally unaware of your existence, let alone your value;
(2) Those who are actively prepared to dismiss you;
(3) Those fiscal status-quoists who believe their life's function is to prevent the company spending money;
(4) Those needing to protect their own status;
(5) Indifferent and ill-informed, all around you;
(6) The good company worker, needing help.

Since this last category is the course of ultimate satisfaction on the happy days, and since he presents no problem to us, I will only share the regret you feel when he leaves for a better company. Perhaps if industry made a genuine attempt to find out why people left, instead of treating everyone as dispensable, then management would learn what some workers valued in their working environment, and this might well include an efficient information facility.

There is, of course, no need to justify your service to the converted, and unfortunately too much library propaganda is wastefully directed at our allies; and possibly with too much amateur flamboyancy, but I'll leave that detail to those discussing techniques. This leads inexorably to the complete paradox: friends need no conversion—enemies are beyond it, and may use your dynamism as an edge on which to sharpen their swords; while the indifferent will never be influential enough to better the case. Depressing, isn't it? One curious facet of management that operates against information services I mentioned before—that of the faith in external sources, irrespective of value in return for cost. This snobbery can be your salvation. There must be many cases where senior management discovers the reputation of its own information officers from outside sources, and if this is typical then it follows that you should be prepared to sell yourself outside the company as much as within. The field is wide open: contributions to the professional arena and letting your company know of them; seeking company facilities for external meetings; representing the company at conferences, and on committees apparently peripheral to professional activities; letters and articles in the relevant *trade* press (which really bowls them over), &c. I must stop myself offering solutions. Your problem may well be that neither the company, not the particular industry, offers the opportunity for such altruistic rabbiting. From my own experience, however, I have discovered that odd activities in the external trade press did far more good than full-time internal promotion. I think more people knew of me at NCR for one humorous letter I had published in 'Computer Weekly' than had ever handled my fortnightly abstracting service. A criticism of newspaper libraries published in 'UK Press Gazette' found me more friends in IPC than in the list of my regular formal contacts. If you cannot recognize an opportunity to use the media of your industry, then you must have a poor comprehension of the information sources you handle daily. If there are company restrictions on this type of activity, then there is no point at all in attempting to believe that you can ever justify your service internally. A company that deliberately behaves in this way has admitted its prejudices and has closed its ears. Either lie down, or get out.

As a rider to this extension of narrow internal services, there is no reason why any published service produced by you within a company should not be made available to customers. What you have to do is find the machinery by which it can be done. If you succeed, you could be made for life. In any event, it should protect you for at least two years. And why should it stop at formal publication? Why not offer direct information assistance to customers? Can it harm the company any *more* than some so-called customer relations exercises presently undertaken? I suspect that at the bottom of the objections to this precocious type of activity is the fear that you are threatening inroads into salesmen's commissions. But thereby hangs a tale for another conference. Perhaps the major recurrent problems of emphasizing your value to the company lie in the fact that you are seen too often as a management service, and therefore to Calvanistic concepts, a luxury. If more opportunities arose which allowed you to be directly productive, rather than intangibly indirect, perhaps the changes would be for the better. Whereas the company product is, in theory, controlled by the customer and the market-place, no market research or consumer protest is going to protect you. The public is unaware of your existence, which in a consuming society is fatal. Whether we *should* be a consuming society, I leave to you—and our descendants. But to restore your egos, your kind will still be needed should society be forced to change.

Any debate on the type of publicity needed, whether the aims should be qualitative or quantitative, will be expanded by the rest of today's speakers. The major remaining enigma is, if your existence *is* so essential, why is all this justification necessary? In spite of, or as a result of, my own meditations—I am not sure that I have resolved this, even for myself.

Before I sum up, I will refer to Professor Allen's gatekeepers, so fashionable a few years ago. He stimulated our egos by identifying those key people in any organization who tend to become the centres of knowledge. He inferred that our sole purpose in life was to feed these individuals with the necessary fuel. We, like fools, fell for it. All that happens is that these stars head for the top of the bill while we remain where we were. If I have *one* message it is that you must convince management of the salient truth conveniently ignored by Professor Allen. Not only are you gatekeepers, you are the watchers at the main gate. Professor Allen's sentries should be shown to be supplementary to an information service—they are components in a circuit. You are the current. One cannot survive without the other, and it is the recognition of this for which all your justification must strive. There should be no humility. If you humble yourselves, you will soon discover the way to the door. Your problems are to decide how far you can allow the media you provide to represent you, and how far you can expose your own personality without endangering your service. This enigma is not just your own. It applies in any situation where operational functions are provided by real people, who have a natural desire to feel wanted. You are trying to shout, amongst a discord of voices.

Summary of conditions

Motive	Degree of external competition	Present → Absent			*
	Degree of need to protect livelihood	Necessity → Safety			
	Depth of professional creed	Strong → Flexible			
	Degree of job satisfaction	Strong → Weak			
Divisive	Subsidized management service	Yes	or	No	1/2
	Self-sufficient earning visit	No		Yes	
Purposive	Expenditure produces output	Yes	or	No	1/2
	Output justifies expenditure	No		Yes	
Corporative	Production, market, or service base	1/3			1/72
	Single product or diversified	1/2			
	National or multinational	1/2			
	Market percentage. Low v. high Low v. other lows High v. the rest Average middle share Monopoly Duopoly	1/6			
Incisive	The executive The administrative The auditive The hostile The indifferent The converted	PRIME target			1/6
Distributive	Internal	Yes	or	No	1/2
	External	No		Yes	

Company profile presents 2×2×72×6×2 nodes of interfirm comparison; or 3,456 permutations.

*Motive offers (No → Maybe → Yes) × 4 $= 9^2 = 81$

$$81 \times 3456 = \underline{\underline{280{,}936}}$$

Over 1/4 million factors affecting an information officer's operational tactics!

DISCUSSION

MR A. R. THORN (MTIRA) said Research Associations are probably in the Utopia class mentioned by MR GEE but it is part of the function to satisfy information needs of members and non-members. We find, however, that if extensive work is required companies are unwilling to pay even moderate fees compared with those paid to consultants. Research Associations are having to become more commercially minded because of government policy but we do not see that it is going to be easy to encourage engineers in particular to spend money on information.

MR R. D. GEE replied that he was thinking more about a national customer relation service but there are often structures in a company which prevents this. It is true that management is often prepared to spend large sums of money on consultants, although the day of the consultant may be declining. Management may tend to use their expenditure on external sources as an excuse for not providing adequate funds for the internal service and vice versa. Management must be educated to understand that the two kind of service are complementary.

The CHAIRMAN added that all information services have to justify their existence and it is this need which gives them momentum although it can also be frustrating.

MR J. CAMERON (E & P Development Consultants Ltd, Sidcup, Kent) said his own company is an amalgam of many different functions, including consulting, construction, marketing, etc. Trying to explain to many different kinds of people how information can operate to their benefit is difficult and time consuming.

MR R. D. GEE replied that in the long term the answer lies in the education of managers in polytechnics and regional management centres. Here trainee managers should be exposed to good library and information services and they will tend to expect to find these in their working environment and know how to use them.

MR. V. N. RICHARDS (British Steel Corporation, Port Talbot) added that the link between management consultants and Librarian/Information Officer should be strengthened and that this should be done quickly. Present job-evaluation systems tend to place information work low in the prime-ranking order. This reflects a failure by many consultants to appreciate the intellectual standards and ability demanded and the quite complex permutation procedures necessary for effective intelligence work. A good Librarian/Information Officer must have an awareness of personnel, actual job activities, and a 'technical' grasp sufficient to make selective dissemination of information one of the most profitable activities within a company.

He would stress that Aslib could and should seek to educate leading management consultancy companies such as McKinsey & Partners, Urwick Orr, etc., in the complex lateral thinking and other techniques often required for a successful information transaction. This strategy will not provide an instant cure but it may well stop the further unwarranted devaluation of our function and help to lift our profession up from its present rather depressing situation to its proper level.

MR L. J. ANTHONY replied that Aslib consultants have co-operated with management consultants in the past and would certainly not miss an opportunity to do so in the future. Whenever they have been called in by management the result has usually been some enhancement of the information officer's status in the organization because they tend to look at the information department's functions in relation to the whole organization and discuss this with the senior management.

Information services in industry

THE FUTURE PROSPECTS

B. C. Burrows

Group Information Officer, Associated Engineering
Developments Ltd, Cawston, Nr Rugby

Paper presented at the one day conference on Promoting Industrial Library and Information Services, Royal Aeronautical Society, London, 4th July 1973.

THIS TALK is about the future. There is only one certain thing we know about the future and that is that we know nothing about the future.

However we can see possible developments by an objective assessment of the present situation in relation to the present and the past. History can be used as a guide line for the future. This is not often done. The introduction of new technologies such as computers are seen as new projects with no connection with the past. This is of course not correct. However history can become an obsession so that one lives in the past in the present. Examples are Northern Ireland and the Middle East.

The present position

I have been puzzled for a considerable time by the attitude of management to information services in industry. In the end I came to the conclusion that in many cases there was no attitude. At best there was a subjective attitude but only on a single problem solving basis when information was required.

From this I was led to studying the business organization and its information needs. I found that these existed in all companies but they were not organized on an overall basis. These had grown up on an ad hoc basis as they were needed. Before proceeding further it is necessary to define the information areas in industry.

Information generated by the company

This consists of

(a) Accounts, budgetary control, etc.
(b) Production control information.
(c) Stocks and stock control information.
(d) Marketing information.
(e) Patents information.
(f) Research and development.

External information

The last three items (d), (e) and (f) lead on to information outside of the company. This mainly consists of the type of information we handle which is in the form of books, periodicals, standards, etc., the scanning of which is necessary for any research.

However there is also an overlap with Marketing and Patents. Both of these job roles require much information which is published in the form of statistics, and patents issued by other companies.

One of the barriers to good organization is lack of empathy. We as a profession have been guilty of this. In fact before we can sell our services we must do our own market research on the industrial management. This means of course seeing things from their point of view.

Therefore what is the Manager's point of view to information? First he regards information about the performance of his company as vital so that he may control it. This information is supplied by the accountant. However there is other information just as vital. This is production and sales figures.

All this information needs integrating. This is why computers were introduced to do this. However in most cases the computer staff were not able to do this because they did not see the problem and in many cases did not want to, except in terms of the computer.

The answer to this was the systems analyst. He linked the work of the accounts, stock control, production and sales. This is what a manager means when he uses the term 'Management Information System'.

However it still left the function of the Information Officer/Librarian outside the management structure. Therefore what is needed is recognition of management needs for services as a whole. This means appointing to board level a Director of Management Services. These services can then be planned on a company basis. In fact this has happened in some companies.

Another thing we need to do is define what we mean by the word information. There is knowledge which is a mental concept, information which is knowledge in a physical form and data which is information reduced to a code or formula. We often use the word information to cover all of these. The distinction between information and data is essential. So far this has not been done by the computer staff. In cases where information can be reduced to data and is required on a regular basis the answer is the computer. The computer also can handle information as soon as there is a controlled language, (i.e. a Thesaurus). It is here that we can establish a dialogue between the Information Officer/Librarian and the systems analyst. I am hopeful that if this dialogue is substained then the two job roles will merge.

We have a lot to offer. So far our main task has been to monitor published information and bring this to the notice of members of the organization one works for. Our other roles are:

(a) preserving information which unless we act to save will be lost, i.e. (archives role). I would regard organizing files of company reports as falling into this function.

(b) influencing the systems analyst on indexing techniques. I have had discussions with several intelligent people at executive level in industry who find it difficult to tell the difference between an index and a list.

(c) Liaison role. Our experience of classifying and information searching means we are instinctive 'lateral' thinkers. This is most useful in a liaison role where all the other members of the organization think only in terms of their job role on a personal basis and not in terms of the organization as a whole.

Incidentally I have mentioned that we should have a market research approach to managers. Expanding this approach I have noticed the following types in the users of information.

Types of users

Most users—Only request information when they need it 'now' and never think ahead. The Information Officer should attempt to do this for them by watching development in the information areas in which they are interested.

The Rest—There is a much smaller number who use an information service a great deal. These can be divided into the following categories.

The Ideal Type—There are a few people who can plan well ahead and it is possible to establish a most satisfactory working arrangement. This type of person is most useful as the Information Officer can use him as a subject expert in information enquiries from other sources.

The Non-Ideal Type—This type of person is always asking for information and no matter how much one supplies him with he requests more. This is because he does not have enough confidence or knowledge to make up his own mind, and hopes to find perfect information made to his requirements.

The Independent Type—He uses the library a great deal but does his own searching. He is worth talking to and getting to know and is often a very useful subject specialist. But you have to approach him first.

Systems thinking

This brings me to my main conclusion which is concerned with systems thinking. This is a term much used by many people. Peter Drucker in 'The Landmarks of Tomorrow', page 8, says.

> There are beginnings towards the new synthesis we need—in biology and physics, in operations research and in modern mathematics, in general systems theory, in semantics, linguistics, and mathematical information theory. We are beginning to move from the old mechanical concept of discipline as determined by static properties of the subject-matter, to new disciplines dealing with such universal configurations and processes as 'growth', 'information', or 'ecology'.

Peter Drucker wrote this in 1959 and at the time it indicated great insight to spot this trend. I also feel that today the image of the trend is a little clearer.

The biologists have developed general systems theory. This is based on a living being as a self regulating open system.

We also have the work of Stafford Beer and F. H. George. They argue that as cybernetics is the theory of control therefore the practice of control is management cybernetics. They also have established a link with the systems thinking of the biologist.

However the work of the systems analyst developed from the work of the systems engineer from the work done on U.S. Government contracts in the

1950s. It is here that we have to distinguish between open and closed systems. The role of the systems analyst is to close the system and reduce information to data that can be controlled.

Definition of systems

1. A logical arrangement of data, things, people or principles.
2. A coherent and organized cycle of methods or procedures.
3. An organization looked at in terms of the attitudes and interrelations of the persons compositng it.

From Management Glossary by H. Johannsen and A. B. Robertson. Longmans, 1968.

Note 1 can be an open or closed system.
2 a closed system.
3 an open system.

We have seen however that man is an open system and very much resents being controlled.

However there is one area ignored by most management thinkers and that is people and the study of people. This is the biggest, most influential, and most complex resource of any organization. We can be most destructive, irrational and most creative and constructive. The janus face of man is well documented by Arthur Koestler in the Act of Creation and the Ghost in the Machine. There is also a close connection between the views expressed in the Ghost in the Machine and Pareto's theory on non logical conduct although it seems Koestler has not read Pareto. Pareto argues that man is an emotive animal and his logical thoughts and actions are built into an emotive basis. This emotive basis Pareto calls residues. However as soon as you mention sociology to a manager he is hostile thinking it is all Marxist in approach. Most people seem to be unaware of the work on social systems by Pareto, Prof. Henderson, Talcot Parsons and Robert K. Merton. In this work there is an attempt to study and document the total social system and its sub-systems such as religion, science, biology, psychology, anthropology, economics and politics.

The mistake that I feel has been made was to use information theory as the model for systems building. Information theory can explain information flow in mathematical terms and therefore forms the basis for closed systems. There is also a link between this theory and open systems in the study of the nervous system and the brain in biology and cybernetics. However this is the same as attempting to describe a social system in terms of one person. A social system at its most simplest is two people interacting with each other. Complex though the brain may be there is more to man than how his brain works. It is what he thinks and the action he takes, and the way these actions are affected by actions of other people which is more important.

Therefore information theory should be used only in the context of social systems thinking when an attempt is made to show relations between information theory and other disciplines.

Lewis Mumford in all his works makes the point that we overrate our present day culture and underrate the culture of the past. He claims that the renaissance destroyed a social systems approach to society in Medieval times and since then there has been endless analysis with little synthesis. The cause of our problem is that we see the machine in economic terms, never social terms. Lewis Mumford calls this the 'Megamachine' approach to society. The work of Talcot Parsons gives us a model to re-establish this.

This model Parsons calls an action frame of reference. In other words all managers should use the social system of the business organization as an action frame of reference within which decisions are made. Prof. L. J. Henderson was saying the same thing in broader terms when he said 'Without a conceptual scheme thinking seems to be impossible'. Talcot Parsons has also done some interesting work on the difference between the act and the action and the role of the actor within this.

If one examines a business organization we see that people see their job roles on this basis. i.e. The Managing Director sees it in political terms (i.e. a power system). The Accountant sees it in economic terms, etc.

This is quite correct provided they are trained to think in broader terms as well.

This does not seem to be happening in the management schools. This despite the fact that the work of Pareto formed the basis via Prof. Henderson of the Hawthorne Studies. These resulted in two main conclusions.

(1) The Hawthorne effect. This is that if you take an interest in people and their work production will go up even if you make their working conditions worse.

(2) The invisible social system of the work force.

A status exists even among people who are all equal in the eyes of the management but not in the eyes of the work force and any change in this social system is a hostile act. The preservation of this is regarded as more important than more pay.

The future structure of the business system

We all know the problem in that we prefer to work for a small firm and feel that small firms are efficient and large firms bureaucratic. However no small firm can afford to pay us nor use any of the expensive services needed today in decision making.

Peter Drucker has shown in all his recent books that the knowledge industry is a growth industry with a resulting growth in knowledge workers. What does the librarian need to do to take part in this because the knowledge industry is generated by the use of computers.

First he needs more confidence in himself. In many ways his thinking is more flexible than the manager. This is due to his training in lateral thinking in classifying materials. This is one of the best methods of training for information work.

Future types of business organization

These will either be

(a) Very small
(b) Very large

The small company will be the creation of one person who will have an entrepreneural approach and will be his own Information Officer as well as Managing, Marketing and Production Director.

The large company

A company making a product with large sales.

A company making many products with large sales (the conglomerate).

The small company is the most efficient but goes through a very critical stage when it expands to the size when the entrepreneur has to delegate.

The large company has considerable problems in getting a flexible non bureaucratic organization which retains overall control.

Decentralization is being attempted by the use of the cost centre. This works well for short term planning but is no solution for long term planning.

It is only by social systems thinking will the organization be seen as a whole.

Donald Schon has suggested a solution in Beyond the Stable State.

This he calls the Constellation firm. This type of organization caters for all needs.

Each organization is a cost centre and therefore has freedom of action. When the return on a product is no longer satisfactory this cost centre can be closed without affecting the rest of the organization. Thus we have a ring of businesses but with all services at the headquarters. This means all the staff of these services will discuss problems with the user and *with each other*.

Well what are the possibilities of these techniques being used in society and the business system in the future. I feel that this is likely because of the way we think and approach problems is changing. Peter Drucker in 'The Landmarks of Tomorrow' says that the analytical philosophy of Descartes has dominated our thinking since the Renaissance and quotes evidence to show that our way of thinking is changing. Lewis Mumford in all his major writings has attempted to persuade us to make this change.

In fact it is now happening. For example the present Government has set up a Ministry of Environment. The traditional approach would be to have set up another ministry, a Ministry of Pollution Control. This has been our approach in the past which has been on the basis of a single problem solving solution. This does not work now as society is much more complex and all problems are interrelated. Often when you solve one problem you create another.

One can also see examples within the business system. For example Job Enrichment and Group Technology. Both have developed the concept of the cell system of production. This could lead to the abolition of the assembly line which is the perfect example of the use of man as a machine (the megamachine approach to society). However I can find no connection in the literature between the relation between job enrichment and group technology. Both have approached the problem from a different position. Group technology is a machine approach and job enrichment is a people approach. Can it be that as we can see a relationship between these two concepts this is an example of the lateral thinking of the information worker.

Another example is the concept of the theory of the firm. This is an attempt by the economists and the accountant to see the firm in broader economic terms.

Other examples are the Delphi Techniques in technological forecasting and value analysis all using groups of people.

However the action frame of reference within which to think should be the social systems model developed by Talcot Parsons.

Conclusion

1. We must be more knowledgeable of the Manager and his attitudes.
2. We must take more interest in company generated information in most cases via the systems analyst.
3. We must attempt to increase our activities in our liaison role.
4. We must attempt to influence the management structure in the setting up of an overall approach to management sevices. It is essential that a Director of Management Services should be appointed to co-ordnate the growing need of services for knowledge workers.
5. We must think and attempt to influence management to think in terms of the business organization as a social system.

However I would like to leave this thought with you.

In order to prepare for the year 2000 we will have to examine Medieval society at its peak as an ongoing social system as the model for the future.

Social systems

Notes with References on Social Systems and their relation to business organizations tabled at meeting.

APPENDIX A

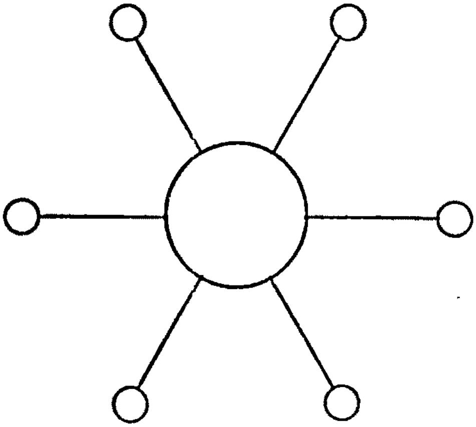
The constellation firm

All of these trends have combined to effect certain major shifts. In response to new technologies, industrial invasions and diversification away from saturated markets, *the firm has tended to evolve from a pyramid, built around a single relatively static product line, to a constellation of semi-autonomous divisions.*

The constellation firm can no longer be defined in terms of a class of products—however general the class may be. There is no set of properties which all and only the products of the firm possess. Instead, the products of the firm bear to one another a family resemblance, which reflects the processes of development through which one led to another.

The firm defines itself as the vehicle for carrying out a special kind of *process.* It defines itself through its engagement in entrepreneurship, the launching of new ventures, or in commercializing what comes out of development.

The constellation firm displays peculiar capabilities for adaptation. Each semi-autonomous unit may be discarded when it gets into trouble, and new units brought into being, without disturbing the other units and without requiring major shifts in the nucleus of the firm.



(Diagram and text tabled at meeting)
(From Donald Schon. 'Beyond the Stable State'. Temple Smith, 1971, p. 67).
(see Appendix A)

The principal figure in the firm becomes the manager of the corporate entrepreneurial process; and the central planning question is this: 'What are the potentials in development for new commercial ventures?'

From: Beyond the Stable State by Donald Schon Temple Smith, 1971, p. 66–67.

APPENDIX B

Social systems thinking

'Without a Conceptural Scheme, Thinking seems to be Impossible'. L. J. Henderson, 'On the Social System. Selected Writings', page 86.

Definition of Systems

1. A logical arrangement of data, things, people or principles.
2. A coherent and organized cycle of methods or procedures.
3. An organization looked at in terms of the attitudes and interrelations of the persons composing it.
   From: Management Glossary by H. Johannsen & A. B. Robertson. Longmans 1968.

Peter Drucker, 'The Landmarks of Tomorrow', page 8.

There are beginnings towards the new synthesis we need—in biology and physics, in operations research and in modern mathematics, in general systems theory, in semantics, linguistics, and mathematical information theory. We are beginning to move from the old mechanical concept of discipline as determined by static properties of the subject-matter, to new disciplines dealing with such universal configurations and processes as 'growth', 'information', or 'ecology'. First attempt to analyse a social system and its sub systems on an objective basis was Vifredo Pareto in 'The Mind and Society'. A Treatise on General Sociology. Translated from the Italian in 4 Vols. 1935. Reprinted by Dover Books, 1963, in 2 vols. Reference to Social System: Vol. 4. p. 2060–2411. These theories were developed by Prof. L.J. Henderson in a series of lectures at Harvard University.

The 'social systems model' for the Hawthorne studies* was developed by Prof. Henderson from the theories of Pareto.

L. J. HENDERSON. *On the Social System.* Selected Writings. University of Chicago Press. 1970.

Students of Prof. Henderson were Talcot Parsons and Robert K. Merton who have analysed the social system in further detail.

TALCOT PARSONS. *The Structure of Social Action,* 1937. McGraw Hill. Reprinted Free Press, 1967. The Social System, Free Press 1960.

TALCOT PARSONS AND OTHER EDS.
Theories of Society, 1961.
Free Press.

ROBERT K. MERTON
Social Theory and Social Structure, 1957.
Free Press.

Other approaches to open systems thinking

The approach of the Biologist.

General systems theory

The theory has been developed by a biologist, Ludwig Von Bertalanffy whose writings have been collected and issued under the title of:

General Systems Theory. Foundations, Developments, Applications.
Allen Lane. The Penguin Press. 1971.

The cybernetic approach

Stafford Beer states that management is the practice of control and that cybernetics is the theory of control. Therefore cybernetics plays a large part in management techniques. These views have been put forward in the following works.

Cybernetics and Management. E.U.P. 1959.
Decision and Control. Wiley. 1967.
Management Science. Aldus 1967.
The Brain of the Firm. Allen Lane. Penguin Press. 1971.

He puts forward a theory which links control systems in science and biology and the theory of the self adaptive control system similar to that of Von Bertalanffy.

---

*F. J. ROETHLISBERGER AND W. J. DICKSON. Management and the worker; an account of the research program concluded by The Western Electric Co. Hawthorne Works. Wiley. 1939.

F. H. GEORGE
Cybernetics in Management.
Pan Books. 1970.

Organizational studies

There are many of these. H. A. Simon is a prominent figure in this field of research. So far as I am aware no theory has been evolved linking Social systems with cybernetics.

Studies of the business organization as a social system

E. J. MILLER AND A. K. RICE
Systems of Organisations. The control of task and Sentient Boundaries. Tavistock Publications. 1967. (Paperback 1970).

A. K. RICE
The Enterprise and its Environment. A System Theory of Management Organizations. Tavistock Publications. 1963.

Systems approach to management

The Theory and Management of Systems by Richard A. Johnson, Fremont E. Kast and James E. Rosenwerg (all of University of Washington). McGraw Hill, 1973.

Systems Thinking. Selected Readings. Edited by F. E. Emery. Penguin Books, 1969.

ADRIAN M. MCDONOUGH AND LEONARD J. GARRET
Management Systems. Working Concepts and Practices. Richard D. Irwin Inc., 1965.

Theory of the firm

This is an attempt to see the business organization mainly by accountants and economists as an economic sub system within a total economic system. Again there is a link with cybernetics as any economic system is self adaptive. Peter Drucker has pointed out that the social function of a business is to go out of business.

Group technology and job enrichment

Group Technology developed from the coding and classifying of components. The cell system of production has developed from this and will play a large part in job enrichment and the attempt to get rid of the assembly line. So far it has just been seen from the point of view of the production engineer. Also the link with job enrichment has not yet been realized. However when it does Social Systems thinking should play a large part in this and we should make management aware of the literature on this.

Other related references

LEWIS MUMFORD.
Main Works:
Technics and Civilization. Routledge. 1936.

The Culture of Cities. Secker & Warburg. 1938.
The Condition of Main. Secker & Warburg. 1944.
The City in History. Secker & Warburg. 1961. (Reprinted Penguin Books. 1966).
An expanded version of The Culture of Cities.
The Myth of the Machine.
1. Technics and Human Development. Secker & Warburg. 1967.
2. The Pentagon of Power. Secker and Warburg. 1971.

Arthur Koestler

The Act of Creation. Hutchinson. 1964. (Reprinted Pan Books. 1966). Outlines the creative and innovation processes of man.

The Ghost in the Machine. Hutchinson. 1976. (Reprinted Pan Books 1969). outlines the non creative side of man. There is a clear account of systems thinking in relation to biology.

DISCUSSION

The CHAIRMAN asked if there was anyone who would be prepared to give an example of a positive management attitude to an information service?

MR A. ARMSTRONG (Kellogg) asked why do we persevere in claiming 'nobody loves us'? Nobody loves anyone in industry. People dislike auditors, accountants, lawyers, P.R. men and so on. We are not singled out for hostility. To think this is only to build up a monumental persecution complex which itself is an unproductive millstone.

MR B. C. BURROWS replied that he agreed, but we must remember that a business can be run without an information officer but not without an accountant! Attitudes obviously vary with the type of company, for example acceptance of an information service is more developed in the chemical industries, partly because they have a systems approach.

MR J. CAMERON (E & P Development Consultants Ltd, Sidcup, Kent) said he sometimes thought that being part of the management structure raises more problems than it solves.

MR B. C. BURROWS replied that unlike the sales organization or the accounts department services have no intrinsic power. This can only be obtained by becoming part of the management structure. It could lead to some loss of personal friendship and trust but this is by no means inevitable.

MR COBHAM (W. R. Grace) said he did not agree with the speakers's basic premise on aiming to be part of management services. Company libraries are aimed at technical and commercial information but not management services. The aim is to liaise with management and make them aware of the resources of the library and not become competitive with accountants, etc.

MR D. A. CURTIS (United Glass Ltd, St. Albans) said one needs to be as wary of being fixed with management services function as any other company division. Fashions change in industry, in our case management services are being cut back; the R & D centre has become the technical centre.

MR E. N. DUDMAN (British Petroleum Co. Ltd, London) added that the information units in a large organization should work together to show management that they are necessary. A tendency in such organizations is for each of the units to work in isolation, not to 'talk to each other'. We in B.P. were in this sort of situation some years ago but for sometime now we have run annual conferences which, obviously, help to make the company's information service work together; it also helps to make management aware of the services. If one invites a Director, or someone else senior, to open the conference, this helps to strengthen the case for having an information service.

MR O. N. BLATCHFORD (Forestry Commission) added that the advancement of information service depends on its increasing use. The conference should devote more attention to encouraging and effecting greater use of services.

Public relations: the soft sell

P. O'N. Hoey

Group Scientific Information Service,
J. Lyons & Company Ltd.

Paper presented at the Aslib one-day conference on Promoting Industrial Library and Information Services, July 4, 1973

WITHIN the framework of the subject 'promoting industrial library and information systems' it is logical to examine the role which public relations plays. Public relations may be described as a short term solution but it should also be part of a long term strategy.

First of all though it is necessary to consider what exactly public relations is. In this context it is useful to compare it with marketing because often the distinction between the two is lost. The marketing job is to assess and convert customer's purchasing power into an effective demand for a specific product or service by presenting the products or service well. On the other hand, the object of public relations is to establish and maintain mutual understanding between an organization and its public. This should be done positively by means of a planned, deliberate and sustained effort.

The remarks which follow will relate to library/information services in any field of work, not just economic, not just technical and so on.

An information service should be 'sold' to its potential users. This equates with a marketing approach, where the product is made or service provided to meet the customer's needs, who is then persuaded by all means possible to buy the product. If a product is not quite right or can be improved, the marketing department quickly changes it to achieve higher sales. Presentation in the right manner and availability at the right time are crucial. This is essentially a customer orientated approach but with a lot of aggression coming from the 'seller', in the present case the library/information service.

Nowadays in library/information services it is essential not merely to provide for identifiable needs but to be prepared to provide for any potential needs. This is much more difficult. One large problem is that the needer will not necessarily realize that the library/information department is able to answer his question, or solve his problem, i.e. satisfy his need. And when that little matter is overcome it is necessary to staff and equip the department in such a way that the service can be given with no untoward delay. So every librarian or information worker has to embark upon a sophisticated public relations exercise; marketing is part of it.

The object of public relations is to establish an atmosphere in which it is comfortable for potential clients to move; at the same time keeps them up to date with the current situation, the resources and abilities available; is easy to approach and always prepared to give an answer when approached.

It has frequently been said that enquirers don't ask the specific question which is worrying them but something more vague, or even that they don't know at all what they want to know. They merely have some feeeling or uncertainty which they wish to clear up. A typical explanation of this is that the client hasn't thought his problem out and he may be the object of some amusement. Information departments should, on the contrary, consider it a real gain, a real step forward when such a client feels able to confide his thoughts in them. Surely it means they have gone partly down the line in setting up an acceptable atmosphere for him. Under no circumstances should they set out to make him feel small by emphasizing an efficient system and giving him a snap answer but, rather, gently help him to make his decision. It is far worse if the question, well defined, is only asked after the research is part way done, the machine ordered or the new product developed. Then they have the more difficult job of persuading their client not only that he is wrong, but that he should admit it to his boss or colleagues. It is doubtful if this happens more than rarely. Every uncertain client should be fostered as well as the certain ones.

First steps

How then should a new librarian or information officer set about establishing this most desirable atmosphere in his department when he first joins his new organization.

The main thing is not to move off too fast in any one direction. In a one-man library or information department there are two points to consider, the clients and the boss(es). In a larger department a third parameter is added, that of staff or colleagues.

Now with a marketing attitude the first thing to do would be to identify the potential clients and try to convert them into users of the service, and try to make the present users use it more. Good public relations however demands first of all the establishment of a clear relationship with the boss. It must be absolutely clear what the organization wants from the head of the service, what resources it will give him to do it with, and reciprocally, he must make clear the route and schedule by which he aims to reach these objectives. In this way, and in this way only, can he be assured of tranquillity around him before he moves out into the turbulence of the organization. Only in this way can he know that when the service has marketed its products it will be able to retail them.

It must be quickly added that this is a step-wise operation. That is, on day one, the head of the service and his boss agree on outline job description and then he sets out to work to this. Inevitably as the days go by this outline becomes clearer in some directions and fuzzier in others. So it is necessary to go back and agree modifications and so on.

This boss-relationship needs to be expanded a bit more. There are many persons who are only too happy when the boss says 'Carry on with the job. I trust you to do it the best way there is. I don't want to be involved'. Just as long as one has enough money in the budget or doesn't have to pay the bills one may say 'This is fine'. It never works for long however.

Take the example from a completely different area of public libraries in the USA. The local government resources are now all being channelled towards educationally based libraries, and away from public libraries. Some of these have had to shut down. A few are now being run as commercial enterprises. Why has this happened? Because, according to American commentators, libraries have not bothered to influence and cultivate the town counsellors or State senators. When the libraries have been discussed in committees no-one has known what to say, they haven't been committed or cared. So they have agreed to monies being spent elsewhere in preference.

Having established the reason for public relations in the library/information service context, it is time to explore more specifically, but still in outline, the ways in which it may be possible to set up a good public relations situation. In the following, this has been split into three parts, consideration of the relationship with the boss, the information department and the client.

Boss-relationship

Table 1 shows some major factors in this relationship. There must be many more. All of them influence the working relationship which exists between a person and his boss. Each one deserves a considered explanation, which cannot be given in this context.

TABLE 1. *Factors affecting the boss-subordinate relationship*

Male/female
Same age
Common ground
Social colleagues
Status parity
Near promotion/retirement
Lunch colleagues
Committee colleagues
New or fixed
Same office
Free discussion
Introvert or extrovert
Dropper in
Skills user
Considerate decisions
High stamina

By male/female the point to be made is, are boss and subordinate both the same sex or not. Then again are they in the same age range and do they have values in common? Are they both new to the organization or both fixtures who know the place inside out? If one is and the other isn't different outlooks will constantly be cropping up. 'Same office' is shorthand for the same working block of offices.

In some situations it is necessary to arrange regular meetings and formally discuss department affairs. In others there may be sufficient casual encounters to make these unnecessary, or it might be thought so until too late. Some people will always by instinct use the right information channel, the available skills, others never, but most people some of the time. So it is essential that reminders are given, gently, of the channels; presence is one of the best ways. The boss should be made aware of the significant events in his subordinate's life and vice versa. The consequences of proposed decisions should be considered before they are taken.

The initial process of breaking down the public image barrier and establishing a more personal link can vary from five minutes to ? five years ? Efforts needed range from negligible to soul-destroying. Nevertheless good subordinate-boss relations, not just adequate ones, must be strived for, if funds are to be assured or at least discussed all round before changes are made.

Why should he, that is the boss, care, it's up to the subordinate to go over to him all the way, or get out. If something seems not to be right in a particular situation a quick check down the list in the table may pay off. Has everything been covered? In a new appointment it is as well to think about these points early on and try and establish useful working links from the outset.

Staff-relationship

The second major parameter to come to grips with is departmental colleagues or staff. All too often overlooked, staff can be the difference between establishing a congenial working atmosphere for clients or setting up an ivory tower; gaining a reputation for willing service or for never being ready to do a job. One-man departments have far fewer worries than those with staff, even if concern with leave of absence, promotions and pensions schemes, is excluded. Similarly staff with a boss who is not in information work and is not sitting in their department have far less trouble than those who do.

The factors to be considered here are the same as with the boss (Table 1) but seen from the other side. Having established a draft job description, with the boss, the head of the information service, the manager, should immediately discuss this with his staff. But public relations in a department begins before a person is recruited. The manager's own assessment of the job vacancy should be checked with colleagues. They may reveal needed assets not thought of. If these assets are acquired colleagues may be assisted with consequent enhancement all round.

The interview should allow sufficient time for a free exchange of ideas to be made on both sides. But a lot has been written about this aspect of management.

More needs to be done in the field of maintaining not only a happy atmosphere, but as important, in maintaining a concerted, directed effort towards the known goals. More than lip service must be paid to ensuring all the staff know of departmental policy decisions and giving them time to voice any queries. Young staff must be encouraged by involvement to participate in the revision of the departmental methodology and their ideas sought prior to policy changes.

There are introverts and there are extroverts; there are jobs which need one of these or a mixture. The principal task for a manager of staff is the accurate blending of the available skills to enable the departmental goals to be met. Each person will have his own style; this should be encouraged unless positively unhelpful to him, so that those clients who are attracted by this style find a natural linking point.

There are some things to be learnt by all new staff, young or old, which can only be obtained from the department itself; the working pace, the abilities of colleagues and their moods, the departmental policies, and the standing of clients are just a few. The manager has the responsibility to develop the situation. To a certain extent systematization can be helpful. He can be surer of a man's activities and behaviour if he confines him to certain specific areas.

If an information and library service is to do a good public relations job in regard to its clients it must have good public relations in-house first. Time must be taken to establish this.

Client-relationship

Having established a firm base from which to work it is then possible to move out into the organization and talk to clients. This activity is the one which is most written about in the literature. Most articles are pitched in a marketing or 'sell the library' vein.

Those aspects which have been covered in detail elsewhere are shown in Table 2.

TABLE 2 *Common activities by which an information department may be "sold"*

Making regular visits to operational departments
Extrovert staff making the best of every potential client-link
Doing a good job on schedule
Getting on committees as secretary
Building up personal friendship-type contacts
Image via an information bulletin

Some aspects which are not covered so often are shown in Table 3.

TABLE 3 *Less common activities by which an information department may be 'sold'*

Knowledge of the working of the organization
Market research of one's potential and present clients
Balancing effort between central and scattered departments
Commercial versus idealistic needs
When to refuse jobs and how
Advertising

Now what is this thing called the organization? If it is a small office or laboratory the problems are far fewer than if it is a multi-product, diversely situated collection of autonomous units. So to reiterate the point made above, start off slowly.

Whereas it is acceptable for an information scientist or librarian to admit lack of knowledge on a specific subject, it is not so for him to be ignorant of organizational connections and hierarchies, unless very recently changed. This reflects a general disinterest rather than a specific failing. Therefore one of the first things to be done on joining an organization is to find out all about its structure and then to continually update this.

Too many people fall into a trap of saying 'This is what the users get now, therefore this is what they want and need'.

In the happy situation of being asked to set up an information system from nothing it is better to wait until everybody and everything has been seen, at least in passing, before being committed permanently to any one particular action. Preferably the clients' needs should be quantified and it is a good thing to take professional market researcher's advice to do it. In the more typical event of entering an on-going situation time should be taken before changing anything. Immediate impacts are only alright if they're right.

During this research is should be possible to identify the natural ferreters for information, and those who need spoon feeding. They need different facilities. Both sets should be pandered to. Some users will be near a service, others remote; a system needs to be flexible to cope with the different needs. It must also be said that a major part of the system is the human element, not the office machines and techniques. It is beneficial to spend time on pleasantries and cut down on the mechanics.

Furthermore the organization will change. What is true now will not be true in three years' time. It is necessary to make a conscious effort to react positively to the dynamic forces which exist rather than drift unthinkingly. It helps to record a situation. This avoids the familiar 'failure to realize how time has flown' situation. It is also good to get out of the organization and look in at it through the eyes of others, at meetings and visits and so on.

Returning to the point made above about public libraries in the USA, it has been shown that most adults think these are mainly used by children. They now find children are served from educational resources. Therefore they cannot see the need any more for the public service. So it is no good making noises like 'libraries are good for you'. The need must be established.

Conclusion

So each library or information worker has the responsibility of taking the time and making the effort to establish the optimum conditions for his own particular operational area. Frequently it is more easy to deal with events as they occur rather than to plan a strategy and stick to it. It is hard work but the rewards in the long term are greater if attention is paid to this side of the business.

It will pay off to take the wider view of things, turn away, slightly, from marketing and concentrate more on setting up an atmosphere into which persons feel naturally drawn, a place where they can raise their worries and ideas, find guidance and solutions. It is worthwhile to concentrate more on public relations.

Acknowledgement

The author wishes to thank the Directors of J. Lyons & Company Ltd. for permission to publish this article.

Further reading

1 Head librarian and manager: dynamics of a creative relationship. N. J. CRUM; *Special Libraries*, 1970, November, pp. 486–491.

2 Managing the information unit: the human factor. R. D. MANNIX; Paper given at the Institute of Information Scientists 5th Biennial Conference, Manchester, April, 1972.

3 Libraries and sales promotion. E. OAKES; *California Librarian*, 1972, July, pp. 155–163.

Education and Training: For Staff and Users

G. R. Cliffe

Librarian, Unilever research, Port Sunlight Laboratory

Paper presented at the Aslib conference on Promoting industrial library and information services, Royal Aeronautical Society, London, July 4th 1973.

Introduction

Surveys carried out in the UK have shown that only about 10% of University graduates in Chemistry have received formal training in the use of the chemical literature and in the case of extra-mural graduates only 2%. This is not the place to investigate the reasons for, or the desirability of, this state of affairs but it leaves us in no doubt that as Information Managers we must make some attempt ourselves to educate the users of the information services.

In the ideal situation, the scientist could perhaps rely on information personnel to use the services and literature on his behalf but this solution is rarely practical and in my opinion rarely desirable.

Methods of Training

Training of users in the use of information services should begin as early as possible in their career. Time spent fumbling in the dark is wasteful and even worse, can lead to the creation of bad information seeking habits which are difficult to eradicate at a later date. 'Catching them early' ensures that the correct usage pattern is inculcated before other, less effective, methods of information retrieval have taken a hold.

I would suggest therefore, either:

(1) Regular courses for new entrants to the firm, or

(2) Work in the Library and Information Sections for a short period for all new entrants.

1. Regular Courses

Courses for new entrants can be effective depending on various factors including the efficiency and standard of commitment of the instructors, the length of the course and the existence or absence of a follow-up procedure. Lectures or informal talks are the usual format for this type of training (Booklets and other printed explanations of the service should be regarded as training aids only). Good visual aids are essential and many of these are now commercially available in the form of films or slides but the majority must inevitably be made internally to fit the local procedures. Programmed learning techniques may also prove useful for certain aspects of information retrieval training, e.g. use of computerized indexes:

Topics which should be covered are:

(a) An introduction to the Section and the services which are available.
(b) The use of bibliographic aids such as directories, catalogues, thesauri, etc.
(c) Instruction on the techniques of carrying out a literature survey.
(d) Sources of information (both internal and external).
(e) How to formulate an enquiry.
(f) Report procedures.
(g) Introduction to library services.
(h) Publications originating in the Information Services.

These courses should be held at regular intervals to cover all the users who have had no previous training and preferably they should be held within the section.

2. Work in the Section

It is not always easy to persuade a manager that one of his long awaited assistants should be snatched away from him for two or three days immediately after his arrival to undergo training in the Information Section. I have found in the past, however, that staff and time permitting, this is the most effective way of inducing the best use of the Information Services. Two things are essential:

(a) The new entrant must be delegated to the Information Section not more than two days after his arrival. Once he is allowed to get involved with his own Section's work it becomes very much harder to get him away.
(b) A programme, agreed with the new-entrant's manager, should be compiled.

This programme should include:

(i) A brief general introduction to the services available.
(ii) Some work on the documentation section which will familiarize the user with types of reports, editing and publication procedures and retrieval tools.
(iii) Introduction to the library services, including an explanation of catalogues, journal holdings, library publications and procedures.
(iv) A literature search on a topic selected by his manager. This should be done under supervision of information staff and should conclude with an explanation of methods available for obtaining the papers uncovered by the search.

The advantages of this form of training are as follows:

1. The new entrant is brought into immediate contact with information personnel.
2. Good information retrieval habits are impressed at an early stage.
3. It conveys to the scientist involved the importance attached by management to good information usage.
4. It is probably easier to obtain the commitment of a user to the training at this stage. Six months later he feels he is too busy to attend or feels he knows it all anyway!

The time allotted to this form of training will depend on several factors such as previous training and experience, the numbers of new entrants, the availability of information staff and the good nature and foresight of the manager concerned. The minimum time should, however, be two days.

Special Training

Under this heading I would class the subjects which require individual courses or lectures and which are often conducted by specialists or consultants. Report writing and the use of patent literature are two topics commonly covered by this procedure but others which may be considered include foreign languages, the use of commercial information and computerized information retrieval.

Staff Training

The first essential of good staff training is the provision of good staff. It is at the recruiting stage that success or failure is determined. Once again this is not the place to discuss recruiting except to say that, in my opinion, personality should weigh very heavily when deciding on the criteria for selection.

The majority of Industrial Libraries appear to be staffed, in the main, by people who for domestic, financial or educational reasons cannot take advantage of full-time library education. Another point is that few Industrial Libraries can afford to give the two years leave of absence required. We are left then with in-service training supplemented by short courses arranged on a national or local basis. These short courses are essential no matter how good the in-service training, in that they provide a common meeting ground for assistants with similar interests and problems. A recent Library Assistant's Workshop, held under the auspices of the Liverpool Polytechnic School of Librarianship, was a good example of this type of short course, intended for junior assistants who would not normally have the opportunity of meeting their counterparts in others organizations.

In the short time available, I must concentrate on the training of non-professional staff, i.e. those who have not reached or cannot aspire to the level of a professional qualification. The method we employ is to arrange for three or four assistants at a time to take a course of eight lectures carried out during working hours, each lecture being of about one and a half hours' duration. The topics covered include (1) The use of the telephone and telex services (2) Alphabetization and general filing rules (3) General reference books (4) Catalogues and computerized indexes (5) Answering an enquiry (6) The Unilever Organization (7) Basic chemical terminology (8) The reporting system.

Although I have used the word lectures to define this course we do not restrict ourselves to formal lecturer and student techniques. Role playing is used where ever possible, e.g. in the lecture on 'Answering Enquiries' both students and lecturer act out the various types of enquiry and it is felt that this technique helps greatly in building up the confidence of new staff. The instruction on 'Reference Books' is given in the form of a treasure hunt and a competitive element is introduced as each student is set a number of practical questions to answer from the books which have been described.

In addition to these talks, all eligible staff are encouraged to undertake studies for the City and Guilds Library Assistants Certificate and visiting librarians are often surprised to be asked to give a short talk to my staff on the systems they employ in their own libraries.

Training is of course, an on-going continuous process and its ramifications demand far more time than is available here. Let me conclude by saying that the information service is a machine costing many thousands of pounds. No one would think of installing such a costly instrument without instructing its users in the methods most likely to achieve the greatest benefits from the equipment. Time and money on user training must be seen as an investment which will pay dividends in the future. We too, must remember that all this training will be so much waste if the image of the information service is bad, if our own staffs lack training and if we fail to inspect regularly the machine we are training them to use.

Publicity or Selling the Information Service

A. R. Haygarth Jackson

Literature Services Section, ICI Pharmaceuticals Division

Paper presented at the Aslib conference on Promoting Industrial Library and Information Services, Royal Aeronautical Society, London July 4, 1973.

COMMUNICATION is really the essence of information science. The best information service in the world has no meaning unless it is used. So the information scientists and librarians must communicate with their users and sell their service.

If the organization is small, then one can rely on personal contact, but, if the organization is large, perhaps geographically scattered and possibly multinational, than personal contact is not enough and one must resort to written and visual communication. This paper concentrates on some ideas and suggestions for effective written and visual communication.

Advertising is, of course, the business of selling goods, services and ideas by making people want them, and information scientists can learn from the techniques adopted by the advertising agencies. There are five reasons why the information officer should go into the market-place and advertise his services, namely:

(1) To beat the competition
(2) To create a demand
(3) To extol the capabilities of the service
(4) To make a new service or technique acceptable
(5) To gain user co-operation

Just one word of warning—ensure that the information services will live up to the claims made for them. It is no good advertising that 'Whacko washes whiter' if it washes dirty grey! Remember that if a product is good users will come back again.

In order to beat the competition or at least compete on equal grounds, the competition must be known. The sources of information with which the information services compete include the oral communicators, who are better known collectively as the old-boy network, which is an essential feature of any organization. Then, there are the invisible colleges, which are groups who swop papers, reports, manuscripts and so on, and, finally, the laisser faire group, who prefer to work in isolation. Economic pressures are rapidly removing this last group from industrial organizations.

If the information services are to compete with the old-boy networks and invisible colleges, then they must be easy to use and accessible. Remember, users are probably overwhelmed by our libraries—which we know inside out, by our data banks—whose coverage and content we have at our finger-tips, and by the mystic of our computer programs—which to us are so straightforward.

The user must first be able to make contact with the information service. Use the internal telephone directory. Persuade the people who construct the telephone directory that, like fire, police and the sick-bay, the library and information unit are essential services, and must be listed on the front page. But this is not enough. All advertisers know that repetition is essential, so make sure the services are listed by name—Library, Reports Collection, Patent Literature—in the alphabetical section of the directory and also include the names of the people responsible for the services.

In a large organization, it may be necessary to define the location of the library/information service. Put your service on the map and arrange for signposts to be erected. If the organization is composed of several blocks, then start at the main entrance and have a series of signposts. If the service is located in a high-rise building, then have notices by the lifts stating the floor for the library/information service. Having reached the information service area, then it may be useful to have a plan showing the layout of the various services or, in the case of the library, a general plan showing the position of categories of stock, for example, abstract journals, dictionaries, reference works, chemistry journals, biology journals and so on. Each service should be signposted and labelled so that the user knows exactly where he is. Likewise, if you wish the user to adhere to some housekeeping instructions, make sure that there is an appropriate notice to guide him.

The next step is to tell everyone, from the newest recruit to the top management, what your information services can do. If the organization runs induction courses for new members of staff, ensure that a talk on the information services is part of the curriculum and try to include a tour of the services. Another method of publicizing the standard services is by using introductory guides. These guides should be designed to encourage people to read them. An attractive cover may help them to stand out in a mass of papers, or use some sort of gimmick which arouses curiosity. The contents should be carefully presented and include a list of services, the names and telephone numbers of those to contact. The description of each service offered should be brief and only a summary emphasizing its scope and how it can help the user. It should not describe the complexities of the computer packages and it should not include information handling jargon and acronyms because these features immediately deter the user.

So far, users know how to contact and find the information services and, briefly, what services are available. The foundations are laid on which to start to build. The user should realize by now that you wish to help him, that you are efficient and, hopefully, you have gained his confidence. But he has to use the services to find out whether they are effective and, for this, he needs more guidance.

The user will need to know more detail about the services offered. One answer is to prepare a series of guides, each covering a specific service or range of related services. For example, most organizations have some form of in-house reports system and guidelines may be helpful on how to prepare the report, not just the format and technical content, but guidance on security category, circulation, number of copies required, etc. Another guide could direct users to all the sources and channels for finding out information of a particular type appropriate to the industry, for example, for a pharmaceutical company, a guide to sources providing information on potential new drugs. These guides should be well constructed, making full use of tables and diagrams, and only a succinct description. The inclusion of a good contents page or index is essential and, if necessary, a glossary too.

Another approach is to use teaching machines or tape/slide presentations. These utilize one track of a cassette tape for speech and it is synchronized with the other track which controls a sequence of 16mm or 35 mm projected illustrations. This technique has been adopted by some of the London University Colleges and others to instruct students on the use of complex reference works, such as Beilstein and *Chemical Abstracts.*

The user must be kept up to date. The in-house alerting bulletins can help in this area. These bulletins have their special purpose of alerting users to new patent specifications, new reports, articles and papers of interest, and so on, but they can carry special notices, perhaps announcing a new service facility or a revised guide. A little thought given to the content and format of these bulletins can encourage their use. For example, a library bulletin can include a 'For Disposal' section, and the occasional gem, such as an obsolete *Whitaker's Almanack, Pears Encyclopaedia* or *The Stock Exchange Official Year-Book*, is much sought after by users and so they are encouraged to read the library bulletin.

The good advertiser, having gained his market, continues to advertise in order to hold his position. The information service should adopt the same policy. There are various approaches. A newsletter is one method of informing users about your activities. This can be circulated to all recipients of your alerting bulletins or to all staff on the in-house circulation list, or can be put on notice-boards. Notice-boards should, in any case, be fully utilized by the information service. In Pharmaceuticals Division, we devised an Info Flash system, which is used to advertise new services and re-advertise old services. Info Flash is printed on shocking pink A4 paper and each entry is introduced by a catch-phrase, for example:

WOULD YOU LIKE
ARE YOU AWARE
HAVE YOU HEARD
DO YOU KNOW
DO YOU EVER GET ANNOYED
THIS IS A UNIQUE OPPORTUNITY—
DO NOT DISMISS IT LIGHTLY

The objective is to alert users so that they make full use of the information services, and there is an attempt to appeal to personal pride and imply a loss of individual status if the scientist does not make full use of the services. Again, this approach is in keeping with techniques used by the professional advertiser.

From time to time, the information service can mount displays to interest users but which also keep the information services in the limelight. A display could illustrate the invention of a well-known product, present a historical collection or progress being made on a new building.

Most organizations have a house journal and usually they are widely read. The information officer should cash in on this mass market and cultivate the editor, so that the occasional article appears on the information services.

Sometimes, the information officer has to create a market for a new product. This can be achieved by the Newsletter or Info Flash or perhaps by a special notice in an appropriate position. For example, one advantage of *Chemical Abstracts* on microfilm is the facility to make prints, so that note-taking is eliminated. On introducing *Chemical Abstracts* on microfilm, the librarian might put a notice, by the hard copy version, along the lines—'*Good News! No more note-taking.* Try the CA microfilm prints.' It goes without saying that suitable instruction must be at hand so that users know how to use the microfilm reader-printer.

The information service is always evolving either to improve the service and/or its cost-effectiveness. The user has to be encouraged and educated to accept new techniques and presentations. In Pharmaceuticals Division, microforms are slowly gaining acceptance. This has been done by the provision of good-quality readers and the availability of literature or documentation that the user knows can only reasonably be obtained or distributed in microform.

Although we know the user is always right, sometimes he does let the side down and 'illegally' borrow something. In these circumstances, it is best to apply a little psychology. It is no good circulating a notice, 'Will the person who inadvertently stole from the library . . . . please return them at once.' because it implies that the library wants them. The tactful and more successful procedure is to circulate a notice, perhaps in the library bulletin, reading, 'The following are missing from the library. Their early return would be appreciated by others wishing to use them.' This notice implies that other users require the publications and, in general, dog does not bite dog!

The information service should, by this stage, have gained the user's co-operation. One scheme which works well at the Rand Afrikaans University in Johannesburg is an amnesty sack whereby 'illegal' borrows are anonymously put in a sack provided for the purpose, and placed outside the library. The library has its stock returned and there is no recrimination. This approach was tried by Pharmaceuticals Division for the return of reports. It was known who had reports out on permanent loan but writing individually was a major task. An Info Flash was used to announce a reports amnesty, and asked for the return of reports no longer required so that they could be microfilmed and to save work in launching a new mechanized loans control system. About fifty per cent of the reports on loan were returned. This is user co-operation.

How do you know when you are really beginning to sell your information service? One measure is when you feel like hanging a notice on your door which reads, 'Please do not disturb', but, of course, you never do because, if you did, you would immediately destroy all your work.

DISCUSSION

MR A. ARMSTRONG (Kellogg) wanted to know how, in expanding and in improving our services, do we avoid being classified as an empire builder?

MR G. R. CLIFFE said by trying to provide the service first and then, when it is shown to meet a need, asking for the resources required to maintain it.

MISS A. R. HAYGARTH JACKSON added that services can be improved without necessarily asking for more staff. A great deal depends upon whether or not the parent organization is itself expanding.

MR P. O'N HOEY replied that any expansion requires management approval so presumably it has already been justified to those who matter.

MR V. N. RICHARDS (British Steel Corporation, Port Talbot) said he would like to comment on the link between the standing of information services and the will of the information officer to stand on their own and not to hide behind the skirts of other department. It would be an important gain for the profession if they created the situation whereby it is no longer rare for a practising information officer to have a voice at board level. It is becoming increasingly important for us to alter the categorization of information officer as members of one of the so called 'minor professions'. We have perhaps some of the most capable lateral thinkers, sharpened by the demands of stringent time and other resources. Workers and directors are now in the offing, surely there is a real and desirable contribution to be made by Librarian/ Information Officers at policy making levels.

MISS A. R. HAYGARTH JACKSON said that the part of the answer is to do the best possible job and have confidence in your ability.

MR GEE said that Mr Cliffe's valid criticism of the information capability of present graduates will possibly be short-lived. The polytechnics are building courses around the use of information as a prime requirement. Gradually lecturers are pressing us to talk in great depth to their students on search techniques, project advice and presentation of results. We hope that in five years your typical industrial client will be a much more stimulating person than the present example.

MR P. HARRIS (J. Lyons & Co. Ltd. London) said he liked Mr. Cliffe's scheme for giving new members of staff a two day introductory course on usage of the Information Dept. However does not that lead to the danger of giving these people false confidence in their ability to retrieve information in their future work rather than use the service available.

MR G. R. CLIFFE replied that the two day course gives them a start in the right direction and enables them to get to know the staff, very often it shows them how little they do know and encourages them to come back when they have real problems.

MR J. CAMERON (E & P Development Consultants, Sidcup, Kent) said one of the advantages of giving newcomers a briefing session on the information service is that it enables the information officer to extract from them details of their own expertise and experience which can be recorded for future use.

MR S. CHALMERS (3M UK Ltd, London) said that if remote users are unable to meet the library staff in person the appearance of photographs of the latter in the house magazine might help to make them more approachable by users.

THE CHAIRMAN added that the same principles should operate whether a user is near or far. One should not draw a distinction between 'insiders' and 'outsiders'.

MISS C. R. PRATT (Legal & General Assurance Society, London) asked the panel if they have any suggestions to make on maintaining good public relations with library customers situated away from the library.

MR P O'N HOEY said that all speakers stressed the need for personal contact in some way, i.e. by the Information Officer paying regular visits to remote users if this can be done, and by encouraging users to visit the library whenever possible. Such contact provides the basis for the normal use of the service by telephone, telex and post.

Technical Note

A device for recording the process and result of manual search of inverted files

WE HAVE RECENTLY been concerned with devising a search tool for a group of geographically spread workers, concerned with searching through records of sone 10,000 items. The data base is held on computer and we considered both the use of an output punched tape to create feature cards and of an output dual dictionary. The arguments against each were, however, not inconsiderable.

Apart from the cost of making and regularly updating feature cards, examination of the little points of light can be tiring and recording of the results is (especially with an untrained or infrequent user) often inaccurate; devices for keeping the pack correctly registered are not very efficient and if—as in our case—there is likely to be more than one string of 'or-ed' descriptors in the search, there is a real problem in ensuring that every permutation is used. Dual dictionaries' lists of numbers are not easy to compare and where more than 2 or 3 descriptors are used in the search, the user seems generally to end up with a messy and frequently only partially legible string of numbers! Neither system produces a permanent record as a by-product of the search itself, and neither is easily used with nested brackets. Examination for 'closeness of fit' often necessary where a search formulation is too precise, means more card or list manipulation, and to add descriptors subsequent to the search means, in the case of feature cards, making the original search all over again (since the cards have to be picked out and placed against each other de novo). The tool we have devised, and which may be of interest to your readers, overcomes these problems.

The basic principle

There is a Record Card with a position dedicated to each item (or document). Within each position there is space to make 10 marks. Imagine that instead of a single location for each item (as in a feature card) there are 10 for each, confined to a small rectangle. The ten locations are numbered

6 7 8 9 10
1 2 3 4 5

You can allocate location 1 to the first descriptor and then make a mark in that location in the case of any items with descriptor 1. Location 2 can now be entered for any items to which descriptor 2 applies. And so on. So if you have 5 descriptors in your enquiry, by the time you have repeated this operation for them all, any items with all five descriptors will have a little row of 5 marks. Less relevant items will have four, still less, three. And so on. This is for simple, AND-only search formulations, but the use of the searchboard makes this very simple basic principle applicable to quite complex formulations.

The next paragraphs describe the Diggle-Townley Device, and are followed by a more detailed description of its application to information retrieval.

Description of DTD

The DTD is a device to facilitate the recording of search results according to the principle just described.

1. *The Record Card* (Fig. 1)

The Record Card can best be visualized as a sheet of ⅛" graph paper. Each square represents one *location* and 10 locations make up an *item position*. (In fact, there are no ⅛" squares on the card; the item positions are ruled off, with only the position numbers printed in them). The card comprises 25 columns each of 40 rows of item positions—1,000 items in all. The working area is thus 15⅛ × 10" with a small margin top and bottom and a 1½" margin at each side. At the left-hand side, the margin is cut away as shown in the diagram.

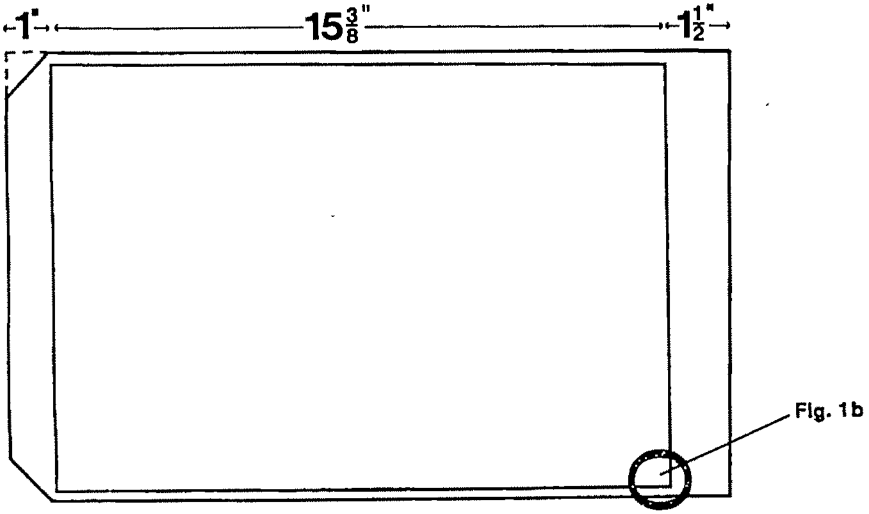


Fig. 1a. Record Card

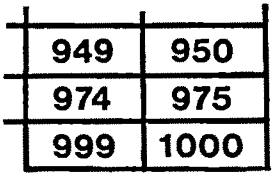


Fig. 1b Corner of Record Card (to scale)

2. *The DTD Frame* (Fig. 2)

The frame's purpose is to hold the Record Card firmly while the Master Card (see below) is held on top of it in one of ten positions corresponding with the 10 locations in the item positions. The Record Card fits exactly into the frame, the cut-away triangles leaving uncovered the ten holes at top and bottom of the DTD by which the Master Card can be held exactly in registration with the Record Card.

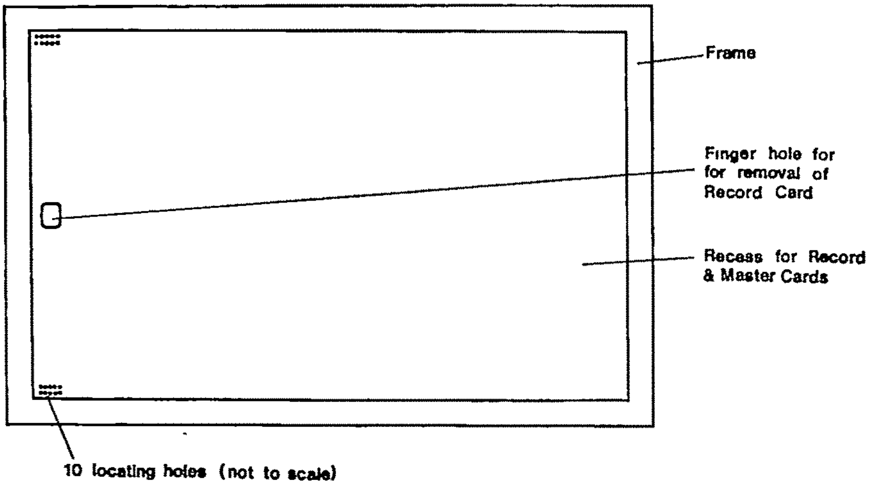

Frame
Finger hole for for removal of Record Card
Recess for Record & Master Cards
10 locating holes (not to scale)

Fig. 2. DTD

3. *The Master Card* (Fig. 3)
The working area of the Master Card is identical with that of the Record Card, and its 1,000 positions correspond with the item positions on that card, and they are numbered the same way. At the bottom left of each item position on the Master Card is a hole $\frac{1}{8}''$ square (Fig. 3b). On the left margin there are a hole at

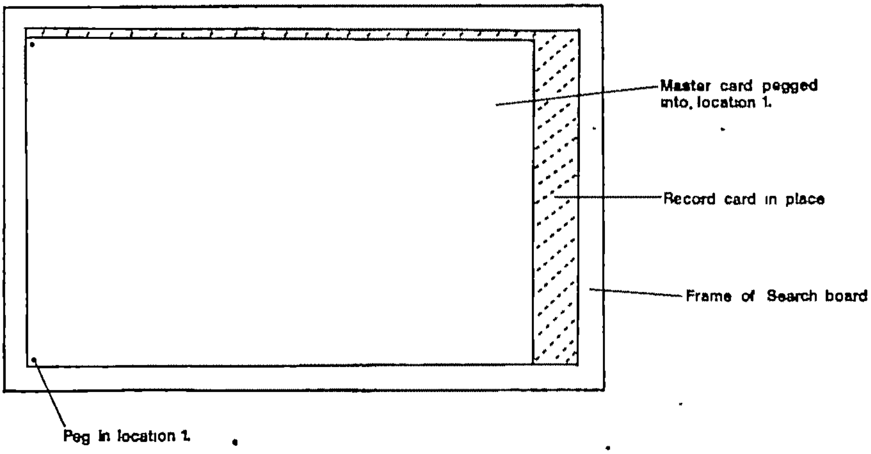


Fig. 3a. Master Card pegged into location 1

the top and bottom. When the Master Card is placed with its left and bottom margin against the frame of the DTD, (Fig. 3(a)) these two holes correspond with the lower left-most holes in the DTD frame; and when it is thus pegged into place in the DTD, its 1,000 item holes correspond with the bottom left-most locations of each item position in the Record Card.

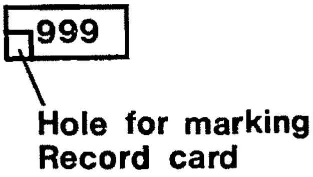


Fig. 3b. One Master Card item position (to scale)

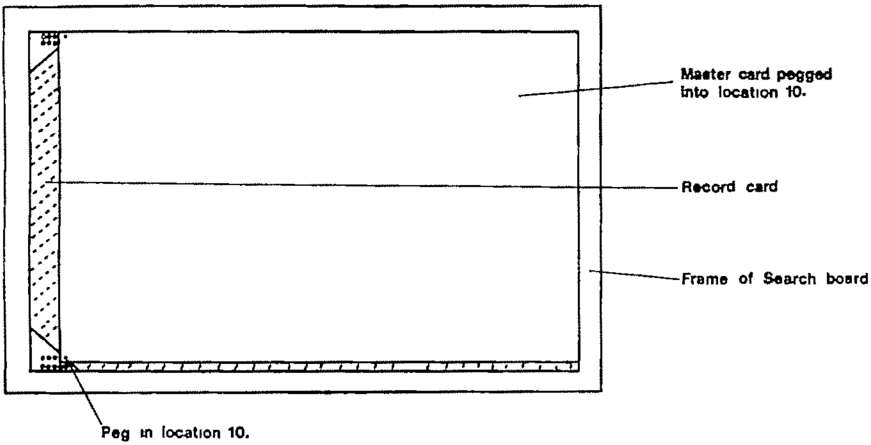


Fig. 3c Master Card pegged into location 10

4. *Using the DTD*

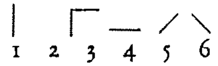
With the Master Card thus held in place, the list of item numbers for the first descriptor is scanned and a dot is made through the hole in the appropriate item position. (A felt-tipped pen is ideal for the job.) The Master is then pegged into the next position along and the operation is repeated. After the first 5 locations have been used, the Master Card is moved up till its top margin is against the top frame of the DTD and the second set of five locations is used (Fig. 3c).

Recording a search

For 'AND'ed descriptors, one uses one location per descriptor. For a string of 'ors' a *single* location is used for all of them: as long as *any* mark is found in their one location, one knows that at least one of the string is present. Fig. 4 is a worked example for

A & B & C & (D or E or F)

In our case it has not been necessary to know which, from a string of 'or-ed' descriptors is present; but this can be achieved by utilizing the squareness of the hole to make six different marks, thus:



When the resultant Record Card carries, for instance, the mark ⌈ in one location, one knows that the 1st and 3rd of the descriptors in that location are present in the item.

This method could also be used if the search formulation were 'any n out of the following m descriptors must be present'.

When nested brackets are encountered, the bottom row of locations is conveniently used for the principal descriptors and the top row for the deeper nestings. Suppose the enquiry to be for:

A and (B or C or D) and (E or (F AND G) or H) but NOT I

On the bottom row, location 1 is used for A, location 2 for B or C or D, and location 3 for I (we use a black felt-tip for NOT!). Location 6, on the top row, can be used for E or H and locations 7 and 8 for F and G. Locations representing a match have two marks in the bottom row and a mark in at least the first *or* the second and third locations in the top row. Any item with a black mark is a non-match.

In the worked example in Fig. 4, the packing of the marks is much denser than is the case in a real situation; scanning of results is simpler than would appear from this condensed version. Hits and near misses are easily spotted. The Record Card, being permanent, can be laid aside for detailed examination for, e.g. statistical analysis of the results, which is very simply made. Similarly, being permanent, the Record Card can be used subsequently for the inclusion of further descriptors, e.g. when the question is asked 'what is the effect of adding such and such parameters?'. The use of a different colour for marking these new locations demonstrated the effect clearly—and permanently.

Conclusion

To sum up, DTD

(a) dispenses with feature cards and reduces the dual dictionary to a simple list of descriptors and item numbers
(b) produces a readable, clean, permanent record of the results of one or successive searches
(c) handles complex logical relations in a search with minimal difficulty
(d) facilitates statistical analysis of the results and examination for 'near misses'
(e) facilitates the subsequent addition of descriptors to the search formulation
(f) facilitates 'n out of m' searching.

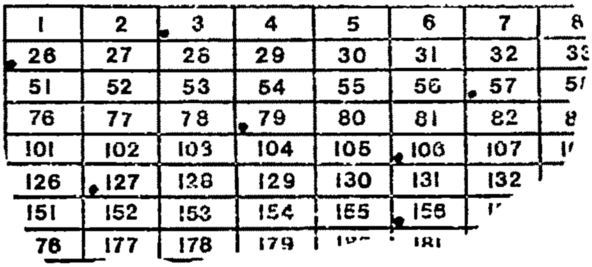
We have applied for a patent on this device, but would be happy to discuss it with those who feel that they may be able to use it or who would like to suggest modifications to it.

Dr. G. E. Diggle and Miss Helen M. Townley

Managing Director, IR Advisory Services (H., C. and K. Townley Ltd)

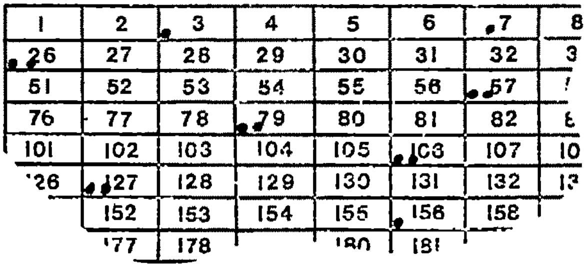
Example of a search for A & B & C & (D or E or F)

4a. *Descriptor A* is listed as being in items 3, 26, 57, 79, 106, 127 and 156. A mark is made in *location 1* in each of these item positions:



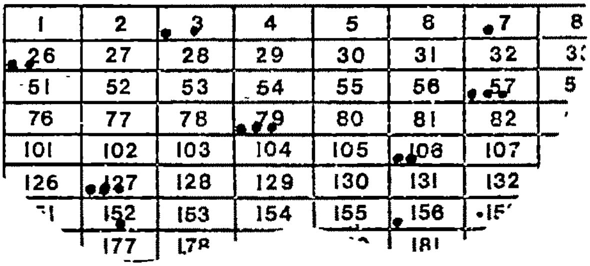
1	2	●3	4	5	6	7	8
●26	27	28	29	30	31	32	3
51	52	53	54	55	56	●57	5
76	77	78	●79	80	81	82	8
101	102	103	104	105	●106	107	1
126	●127	128	129	130	131	132	
151	152	153	154	155	●156	1	
76	177	178	179	1	181		

4b *Descriptor B,* items 7, 26, 56, 79, 106 and 127, is entered in *location 2:*



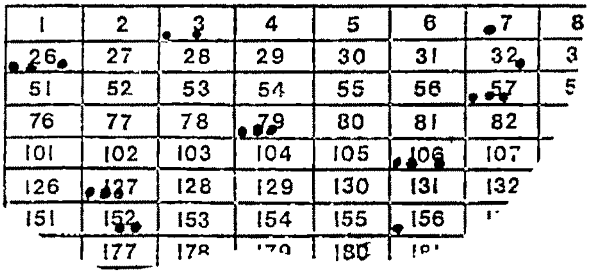
1	2	●3	4	5	6	●7	8
●●26	27	28	29	30	31	32	3
51	52	53	54	55	56	●●57	
76	77	78	●●79	80	81	82	
101	102	103	104	105	●●106	107	10
26	●●127	128	129	130	131	132	1
	152	153	154	155	●156	158	
	177	178		180	181		

4c. *Descriptor C,* items 3, 57, 79, 127 and 152, is entered in *location 3*

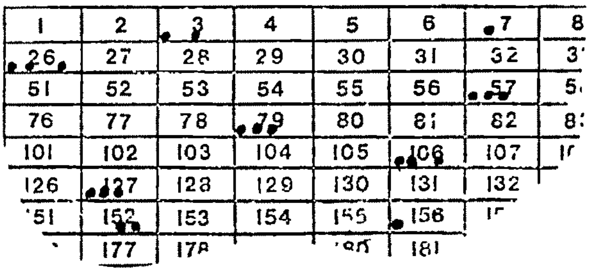


1	2	●●3	4	5	6	●7	8
●●26	27	28	29	30	31	32	3
51	52	53	54	55	56	●●●57	5
76	77	78	●●●79	80	81	82	
101	102	103	104	105	●●106	107	
126	●●●127	128	129	130	131	132	
1	●152	153	154	155	●156	●15	
	177	178			181		

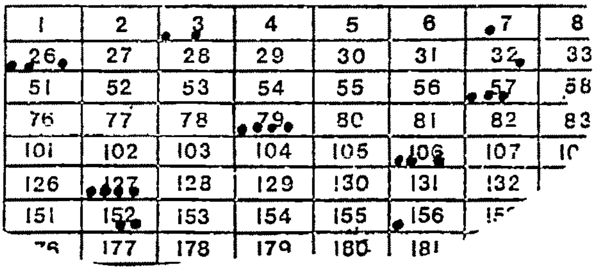
4d. *Descriptor D*, items 26, 106, and 152, is the first to be entered in *location 4*



4e. *Descriptor E*, item 32, is *also* entered in *location 4*, since it is 'or-ed' with descriptor D



4f. *Descriptor F*, items 79, 127 and 152, similarly enters *location 4*, since it, too, is 'or-ed' with descriptors D and E



When the Record Card is examined, only item 79 and 127 has four dots; they are the only ones to satisfy the conditions of the search.

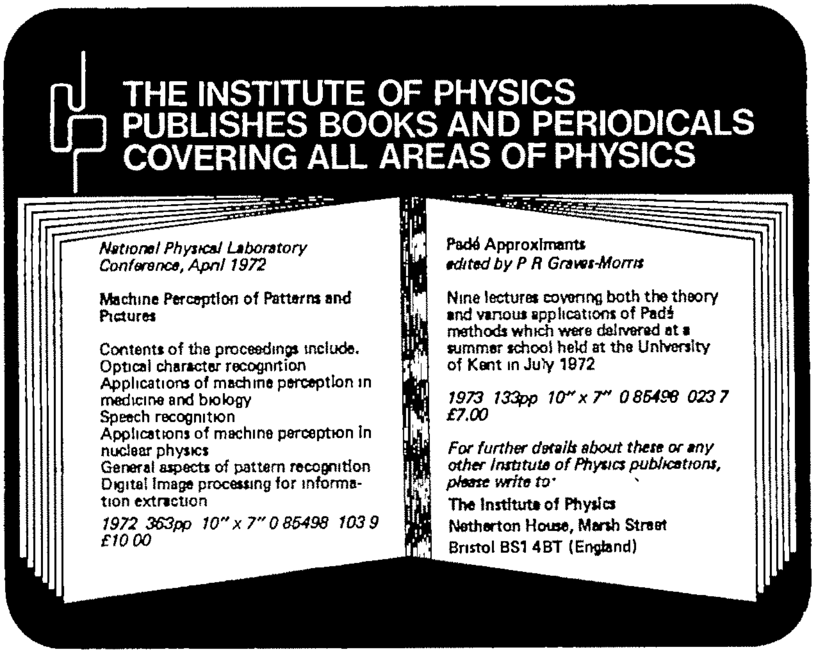
Near misses are quickly seen in 26 and 57.

Note that though 152 has three of the named descriptors (C, D and F) it only has two marks, D and F being 'or-ed' and therefore having only one location between them.

BRIEF REVIEW

HARRISON, P. HELEN. Film library techniques. London & New York: Focal Press, 1973. 277 pp. £8.50. (ISBN 0 240 50820 3)

Although there are many types of film library with different aims and methods of work, many principles are common to all. This book traces their development, and by describing the techniques involved will assist librarians in their formation and upkeep of film libraries. It will also be useful to personnel in business and research who work with film, television and news programmes. The administration section includes detailed treatment of the stringent selection policies libraries face, and the staffing, layout, planning, economics and copyright problems. The handling of films, including shotlisting, cataloguing, indexing, storage, preservation and the future developments in this medium of information retrieval are discussed.



THE INSTITUTE OF PHYSICS
PUBLISHES BOOKS AND PERIODICALS
COVERING ALL AREAS OF PHYSICS

National Physical Laboratory Conference, April 1972

Machine Perception of Patterns and Pictures

Contents of the proceedings include.
Optical character recognition
Applications of machine perception in medicine and biology
Speech recognition
Applications of machine perception in nuclear physics
General aspects of pattern recognition
Digital image processing for information extraction

1972 363pp 10" x 7" 0 85498 103 9
£10.00

Padé Approximants
edited by P R Graves-Morris

Nine lectures covering both the theory and various applications of Padé methods which were delivered at a summer school held at the University of Kent in July 1972

1973 133pp 10" x 7" 0 85498 023 7
£7.00

For further details about these or any other Institute of Physics publications, please write to·

The Institute of Physics
Netherton House, Marsh Street
Bristol BS1 4BT (England)

MEAT RESEARCH INSTITUTE

PUBLICATIONS AND INFORMATION OFFICER required to prepare technical publications for use by the meat industry, and to deal with technical enquiries. Other duties will include preparation of information leaflets and assisting with Open Days and visitors. A knowledge of information retrieval systems would be useful.

QUALIFICATIONS: A degree or equivalent qualification in a scientific subject, e.g. food science, and ability to communicate with scientists and laymen.
The appointment will be in the Scientific Officer (£1,318–£2,177 pa) or Higher Scientific Officer (£2,076–£2667 pa) grade, depending upon qualifications and experience; a minimum of five years' post qualifying experience is required for appointment to the higher grace. Optional superannuation scheme membership of which attracts a non-pensionable allowance.

Application forms: Secretary, Meat Research Institute, Langford, BRISTOL BS18 7DY

Applicants from the Agricultural Research Service should submit their applications through their present Directors if they wish to be considered for the award of "public interest" transfer terms.

Library Removals start here

In Bullens planning office
Every move is planned in detail;
problems of access or timing overcome;
men, vehicles and equipment allocated –
well before the move begins.
So you move safely, quickly and with least
disruption.
That's the difference between Bullens
and any other contractor.
Phone today.

Bullens
TRANSPORT SERVICES
Bullens Transport Services Ltd
408, Hornsey Road,
London, N.19 4EB
Tel. 01-272 6871

*Also at Bristol, Hinckley
and Newton-le-Willows.*

A Gillespur COMPANY

FIRST for carpets
Dodson Bull

UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display
In our extensive London and provincial showrooms
Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.
LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 68402
BRISTOL: 2-3 Royal London House, Queen Charlotte St
BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LG.
Tel: Southend 46569
9.00-5.30 Mon.-Fri. Sat. 9.00-12.00 (Manchester 9.00-4.00)

Bibliographies are the librarians' primary aids . . .

LIBRARY ASSOCIATION BIBLIOGRAPHIES INCLUDE:

Bibliography of the dog. E. C. Jones. £12 (£9.60 *to members*)
London theatres and music halls, 1850–1950. Diana Howard.
£4 (£3.20 *to members*)
Bibliography of nursing literature. A. M. C. Thompson.
£4 (£3.20 *to members*)
Bibliography of film librarianship. Sam Kula.
£1 (£0.80 *to members*)
Serial publications in the British parliamentary papers. Frank Rodgers.
£2 (£1.60 *to members*)
Steam locomotive development. Kevin Jones.
£2.25 (£1.80 *to members*)

Write for our Publications List to:

THE LIBRARY ASSOCIATION,
7 Ridgmount Street, London, W.C.1.

Assistant Librarian

Allied Breweries (UK) Limited require an Assistant Librarian for the Technical Library and Information Service Department within the Brewing and Research Department of Allied Breweries (Production) Limited at Burton on Trent.

Duties will include:

- Preparing abstracts of journal articles and helping to maintain a subject index of articles and patents.
- Preparing subject and author indices for literature obtained for the Library.
- Ensuring efficient operation of library loans and journal circulation.
- Assisting where possible in translating foreign correspondence.
- Preparing bibliographics and literature surveys.

Applicants should be graduates in Information Science or Science Graduates with an interest in library work. The ability to translate German would be an advantage.

Applications in writing, giving age and full details of experience and qualifications should be submitted to:

Personnel Officer (Staff), Burton Personnel Department,
Allied Breweries (UK) Limited, 126a Station Street, Burton on Trent DE14 1BZ.

ALLIED BREWERIES (UK) LIMITED

A new tool to help you build and manage science journal collections

If you are in charge of any general or special collection of science journals, the *Journal Citation Reports* can play a valuable part in making your collection more useful to the reader and more manageable for you. *JCR*™ can help you

- **. . . prove the relative usefulness of each journal in your collection**
- **. . . select the most used journals in any scientific discipline**
- **. . . identify lesser known journals of proven value in a given field**
- **. . . accurately judge how long scientists find a particular journal's issues useful**
- **. . . identify journals from other disciplines which are related to your readers' primary journal interests**

This new service provides carefully selected statistical evidence to help you judge the usefulness of individual journals and the effects of time on the value of published journal articles. It will help you to better understand the patterns of relationships between journals and ways scientists use, read and refer to them.

Once you've gotten the full story on *JCR* you'll see quickly how you can use it to determine the optimum makeup of special and general journal collections as well as the size of journal back files. You'll see how you can use it in managing subscription budgets, in developing journal circulation and photocopying policies and in a myriad of individual ways you can tailor to your own interests and needs.

To obtain the full story on the many uses of *JCR* and complete pricing information, please use the coupon below.

©1973 ISI

ISI JOURNAL CITATION REPORTS™

Please send me full information on *Journal Citation Reports*.™

Name

Title

Organization

Street Address

City

State Zip

Country

Telephone

13 369

ISI®

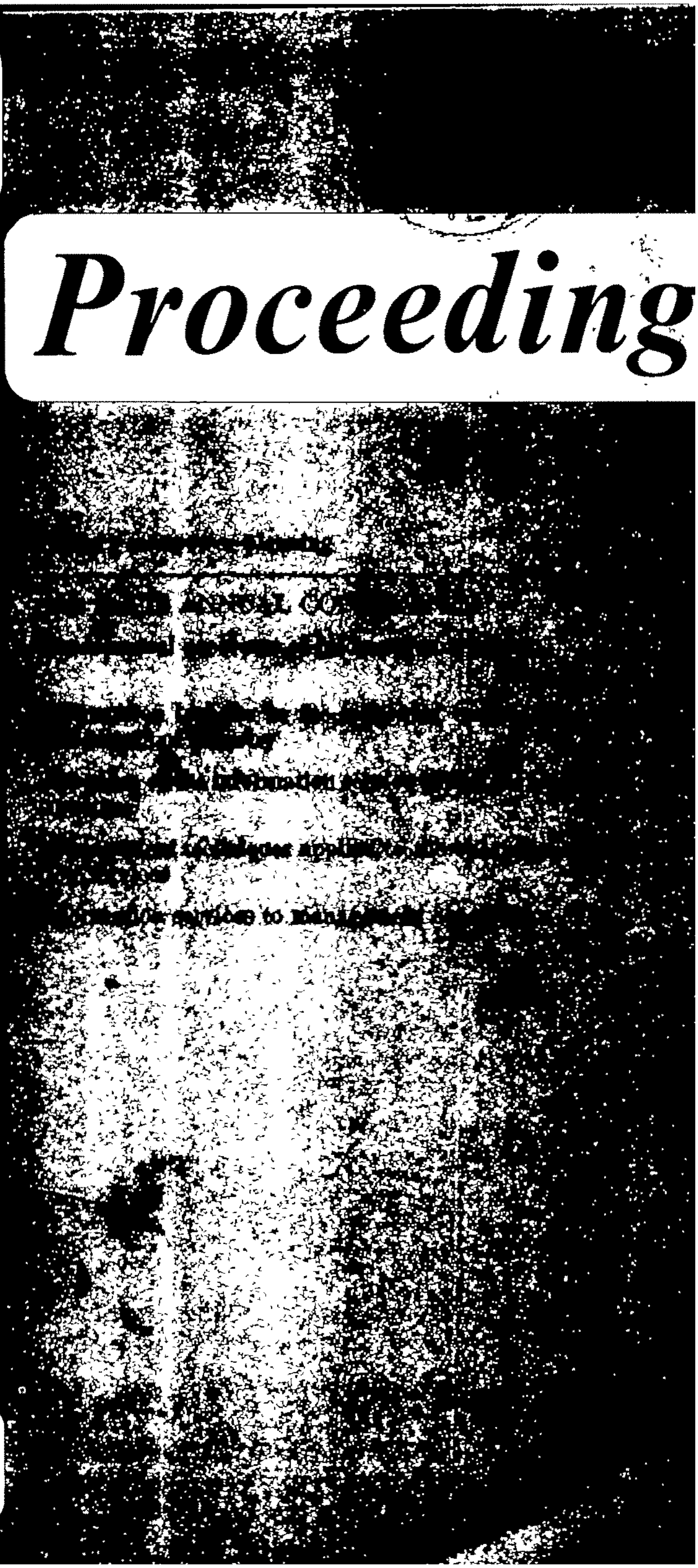
Institute for Scientific Information
325 Chestnut Street, Philadelphia, Pa. 19106
U.S.A., Tel. (215) 923-3300

4 MAR 1974

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib

Proceeding



NOVEMBER 1973
VOL. 25, NO. 11

Full data on all patents from 24 countries in minutes!

Derwent Publications introduces the world's fastest and most comprehensive information service on patents.

Now that patent specifications filed in Japan and many European countries are published so rapidly, they are replacing conventional trade and scientific journals as sources of information on new ideas and latest developments. Also, they provide advance information on related patent applications which will be published much later by the United States and United Kingdom patent offices.

This new interest in patents has intensified the need for a simple international patents journal wherein the whole of the patent literature of the World can be scanned, and items of interest followed up, in a unified system.

From January 1974 Derwent will be providing a new integrated service–World Patents Index–which will completely meet this need.

Each week computer-generated and phototypeset WPI covering *all* subjects will give fully indexed information on over 12,000 patents published 4-5 weeks earlier in 24 major countries. In a single gazette WPI will contain indexes which will allow in a matter of minutes searching by patentee, subject matter and keywords and will identify families of patents.

Back-up information for WPI in the form of English language abstracts for chemical subjects is provided by the highly successful Central Patents Index, operative since 1970 A companion service for non-chemical subjects–General Patents Index–will commence at the same time as WPI. Each week GPI will publish, in book and card forms, abstracts plus drawings, available for convenience in three separate sections–General, Mechanical and Electrical.

Additional services to subscribers include:

High speed central bureau patent searches
Selective monitoring by subject, country or patentee
Copies of patent specifications on request.

No other source is able to provide patents information of such depth, accuracy and speed. Furthermore, the many advantages of these outstanding services can be obtained for a really economical subscription equivalent to only a few pounds a week.

Towards the end of November, samples of WPI and GPI will be available for you to evaluate without obligation and completely free of charge.

Write now (quoting DN) for brochure, giving full details of these services and subscription rates, and for the free samples.

Derwent Publications Ltd.

Rochdale House, 128 Theobalds Road,
London WC1X 8RP, England.
Telephone. 01-242 5823 Telex: 267487
Cables: DERWENTINF, LONDON.
A part of The Thomson Organisation.

DERWENT World leaders in patents information.

CW 1N

Aslib Proceedings

VOLUME 25 NOVEMBER 1973 NUMBER 11

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer back, Aslib London.

Aslib is still seeking a suitable person to succeed Mr Brian Vickery (who has been appointed Director of the University of London School of Library, Archive and Information Studies) as

Head of Research and Consultancy

The holder of this post, who ranks as an Assistant Director of Aslib, is responsible for a general programme of research into library and information problems, for an annual programme of special research projects commissioned and funded by OSTI, for individually and group funded research and development projects, and for Aslib's consultancy services. His annual budget is at present about £80,000 and he has a graduate staff of 16. The post offers scope for an interesting mix of academic, managerial and business talents.

The Director of Aslib would be pleased to hear, in confidence, from persons who would like to be considered for this key post in the information field. The ideal person would have a good academic record and varied experience of library and information work at a responsible level; he would also have demonstrated an aptitude for research (not necessarily in the information field), and be able to develop a distinctive Aslib contribution to library and information research on a national, and international, scale.

Originality, personal ambition and capacity for sustained effort are no handicap. Starting salary will be negotiable within the range £5,500–£6,500 per annum. Please write, briefly in the first instance and under confidential cover, to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL.

Library manpower planning

*E. M. Broome**

Library Adviser, Department of Education and Science

Based on a paper given at the Aslib Midlands Branch one day conference on Staffing at Ashby de la Zouche, April 12, 1973

Introduction

'JOBS SQUEEZE HITS LIBRARIANS. More than 2,000 young men and women filed job applications at the annual convention of the American Library Association in Chicago last week.

The convention made clear the existence of a relatively new problem: a job shortage in a profession that only two years ago was desperately recruiting young talent'.

Though this quotation from the *Times Higher Educational Supplement* for July 14, 1972 relates to the situation in the USA it is one which has its parallels in this country. True there is a tendency for a few well publicized cases or articulate complainants to exaggerate the present situation. Nevertheless while the position is not yet alarming, the results of the survey of students completing courses at schools of librarianship, which is conducted by the Department of Education and Science, show some decline in the job prospects of newly qualified entrants to the profession. Figure 1 illustrates trends in output of the various types of courses, and Figure 2 compares total output (actual and predicted) with the rate of success achieved by students in obtaining library posts following completion of their courses. In circumstances such as these one is increasingly likely to encounter references to the need for manpower planning. At the moment such references in professional library literature are sparse. This is hardly surprising since manpower planning is a comparatively new science, brought into prominence by that great upsurge of interest in planning which has been one of the characteristics of the postwar decades. It was, for example, not until the 1960s that the United States established the framework for a national manpower policy. How then did institutions manage before the advent of planning? It is worth spending a little time in glancing backwards, for the traditional methods of recruitment and training have not entirely disappeared, and elements of the old system—or lack of system—still play an indispensable part in filling a substantial number of posts.

Until recent years the overriding concern of the educational systems was to equip students with a good general education. It was expected that training for the younger professions, as for crafts, would be gained on the job. Thus a school leaver would become articled to an accountant or a solicitor or, if his chosen

---

* The views in this paper are the personal views of the author and not necessarily the views of his Department.

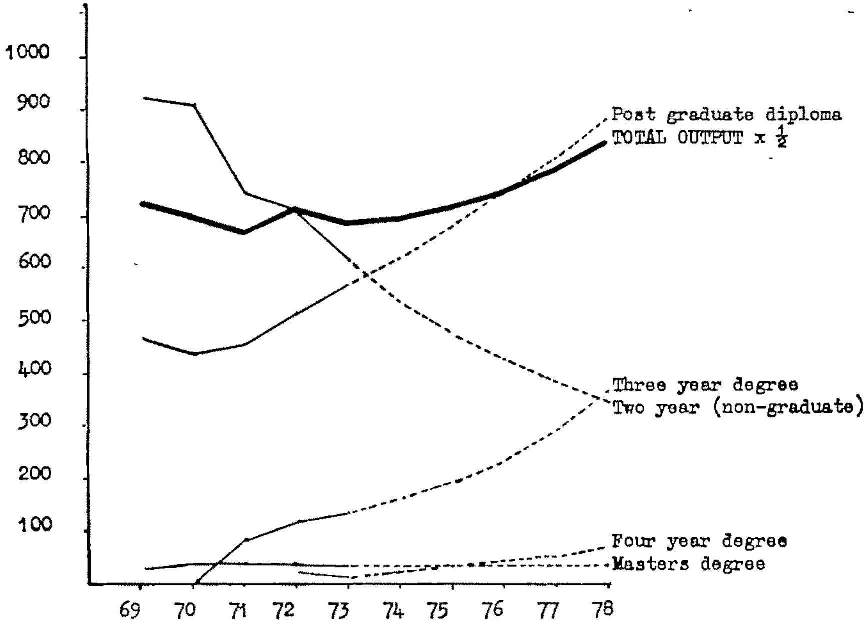


FIG. 1: *Output from library schools, 1969–1978, numbers of students*

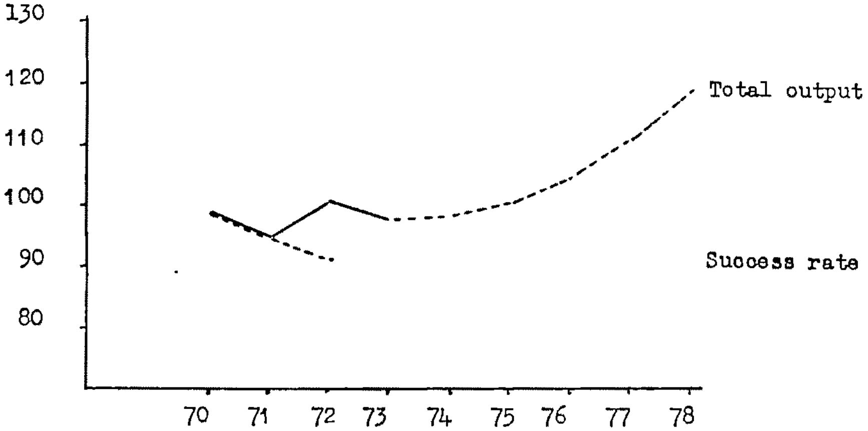


FIG. 2: *Annual output of students compared with success of students in obtaining posts*
1970 = 100

profession was librarianship, he would seek employment as a library assistant. With the introduction of professional qualifications training on the job was increasingly supplemented by formal study, either by evening classes or correspondence courses. Study, it should be noted, which had to be undertaken in the assistant's own time.

The process was often long and arduous, but for the employer it had two great advantages. It was extraordinarily inexpensive—every employee worked a full working week—and it was magnificently flexible, in that an assistant, in the process of studying for his professional examinations, could be given progressively more responsible jobs as he gained experience. Since it was unnecessary for the employing authority to make any great investment in the training process the departure of an assistant who finally obtained his qualifications for service elsewhere could not be regarded as a financial loss. Indeed, during the latter years of the assistant's service the authority had enjoyed the services of someone who, to all intents and purposes, was qualified—some older librarians would claim much better qualified than the inexperienced products of present day library schools—for the cost of a library assistant's or senior library assistant's salary. This system worked well and produced some very fine librarians. Given an adequate supply of school leavers and no great expansion of the service there was no need for planning.

The advent of the library schools and full time professional training did little to change this cosy picture. True, there was the slight inconvenience of having to release staff to attend the school, but this loss was easily made good by the recruitment of replacement assistants. Even more significant was the fact that the cost of training was still not reflected in library budgets. An assistant attending library school received no salary: he was expected to exist on a subsistence grant from the education authority.

Several factors—all related to expansion—finally disrupted the old system. The very great expansion of higher education created a shortage of well qualified secondary school leavers, forcing authorities to think in terms of incentives to attract recruits and retain them. The expansion of the library service along with other social services resulted in a severe shortage of qualified librarians. These two factors resulted in a greater amount of forward thinking by librarians. Trainee positions began to make their appearance on the establishments of more progressive authorities, and while these tended to solve the problem of initial recruitment and ensured a future supply of qualified staff they resulted, for the first time, in training costs appearing in library budgets. Not only this, but the staff, once qualified, cost more to employ, as their salaries increased in line with the general rise of incomes in the economy and the enhanced status stemming from the improved standard of professional training.

These conditions—the scarcity of educated manpower; the rising cost of training and salaries; and the changes in the method and the length of training—taken together, nudged librarians into the position where they could no longer operate as though there was total flexibility of labour supply at all levels but had to begin to think ahead—in other words to plan. But it was and is still, a very haphazard process operating by rule of thumb rather than in accordance with carefully worked out targets; a process hardly to be dignified with the name of planning. The factor which finally forced a more rational approach to the problem was the loss of complete control by librarians over recruitment to the profession.

It can be argued, that as long as librarians remained responsible for recruitment then there was a chance that the level of the intake would be reasonably sensitive to the demand. There was probably a constant state of slight shortage, since librarians were reacting to situations rather than controlling them, but by and large, supply and demand remained in equilibrium; particularly as librarians could use certain regulators—the withholding of recommendations for bursaries, or delaying the granting of leave of absence, for example—to ensure this. But increasing competition for the restricted output of qualified school leavers made it necessary to offer them an attractive path to full professional qualifications, and once the decision was taken to allow library schools to recruit direct from the sixth forms the close links with market requirements disappeared. The slight slack in the market and the vigorous development of services in the early sixties at first concealed the dangers, but with increasing output from the sixth forms and the expansionist policy pursued by library schools the training of librarians began to assume the appearance of a free for all. A recession in the economy and a cut back in development plans and the dangers of over-production emerged.

It is to the credit of the profession that the dangers were foreseen. In 1966 the Library Advisory Councils accepted an invitation from the Secretary of State 'to make a study of the numbers of qualified librarians likely to be required in the foreseeable future'. The authors of the resultant report[1] clearly experienced the same difficulty as that facing the American Library Association which, according to the *Times Higher Educational Supplement*, 'is confronting the jobs squeeze practically without any statistical data'. Consequently the report is so hedged about with qualifications and based on so many untested assumptions that the conclusions cannot be anything but what they claim to be: 'extremely tentative'. This is perhaps not surprising. As the Manpower Research Unit of the Department of Employment and Productivity remarked in 1968: 'The reliability of (national) estimates is seriously impaired if little or no constructive thought has been given by employers to manpower planning'.[2]

The failure of library managers to pay attention, except in the most sporadic and unscientific manner, to manpower planning has to be seen in the context of the traditional approach to library development, which if it called for any long range projections at all confined these to capital expenditure. In recent years increasing attention has been paid to corporate planning—attention which is likely to be intensified in so far as public libraries are concerned by the publication of a report of a working party of the Library Advisory Council for England under the chairmanship of Professor J. D. Stewart.[3] It can be expected that this new emphasis on corporate planning will embrace the all important element of manpower planning.

Why manpower planning?

The need for manpower planning at individual library authority level can be defined effectively by paraphrasing a section of the publication *Company manpower planning* by the Manpower Research Unit of the Department of Employment and Productivity to which reference has already been made:

If vacancies, particularly for highly qualified personnel, are not filled promptly, the efficiency of the organization is likely to be lowered. If, on the other hand, there is under-utilization of personnel through over-manning, there will be unnecessarily high labour costs. The main purpose, or advantage of manpower planning is to enable an enterprise to discover, at an early stage, the critical points in the labour force where shortages are most likely to develop or where there is inefficient use of labour. It is sometimes argued that because forecasts are apt to be unreliable there is little virtue in spending valuable executive time in preparing them. But this overlooks the fact that the study which forecasting requires helps to bring to light potential 'trouble spots'. Forecasts do not have to be accurate to be revealing.

Manpower planning is therefore an invaluable management 'tool' in controlling labour costs and vital to the future efficiency of the service. There are, however, a number of more specific reasons for attaching importance to manpower planning and forecasting—indeed, reasons which make the exercise essential:

1. *The determination of recruitment levels.* Estimates of future requirements are—or should be—the basis for a sensible recruitment policy, that is one which does not involve waiting until shortages have become evident and then hoping that the organization can recruit the people it needs at once.
2. *The determination of optimum training levels.* Manpower forecasting is vital to training and re-training programmes. These programmes must be related to the anticipated job requirements at the end of the training period—and subsequently. For this purpose, the people responsible for training need an estimate not only of the future staff, but also of the future skill and occupational structure of the organization. This is particularly important when the training period is a long one. It is clearly essential, to both the individual and the organization, that the skills for which training is provided are the ones that will be needed in the future and, conversely, that the form of training takes account of the possibility of skill obsolescence.
3. *The provision of a basis for management development programmes.* The purpose of management development schemes is to ensure that suitably qualified managers are available to fill vacancies as they arise. Since the fitting of the right man for senior assignments is of critical importance to the success of the undertaking, the career of individual managers must often be planned with a precision not attempted at other levels. For this reason, knowledge about managerial posts, both current and future, has to be both more accurate and more detailed.
4. *The costing of the labour element in new projects.* A library service is labour intensive. The costing of future projects or developments can scarcely be realistic unless the labour element has also been carefully costed. If manpower requirements have been under-estimated the project will be under-costed and may well become unviable; if the manpower allowance is over generous, the organization may reach the (wrong) conclusion that the project is unduly expensive and should be postponed or abandoned. Either way, therefore, careful calculation of the amount and quality of labour required is essential to a sound decision on whether a project should be pursued.
5. *The planning of future organizational structures.* If future manpower requirements and, therefore, volumes of business, have been determined it is possible to

estimate the effects on the present organizational structure. It may be that on a short term forecasting basis the expected manpower requirements may not warrant changes in the structure, but the position may well be different in the case of medium or long term forecasts, particularly if the organization is in a state of growth. If it can be shown that staff is going to increase considerably then a different organizational structure may well be needed. This in turn will involve, among other things, alterations in plans for career development and promotion, and the creation or extension of specialist posts/sections and support services.

To sum up, manpower planning, by placing an emphasis on labour as a scarce and costly resource that must be used as efficiently as possible, can contribute to a library's future success in an increasingly competitive environment. It enables management attention to be focused on labour problems requiring special attention, in time for considered remedial action to be taken. And it enables a number of decisions, which depend on future manpower needs, to be taken on the best evidence available.

National manpower planning

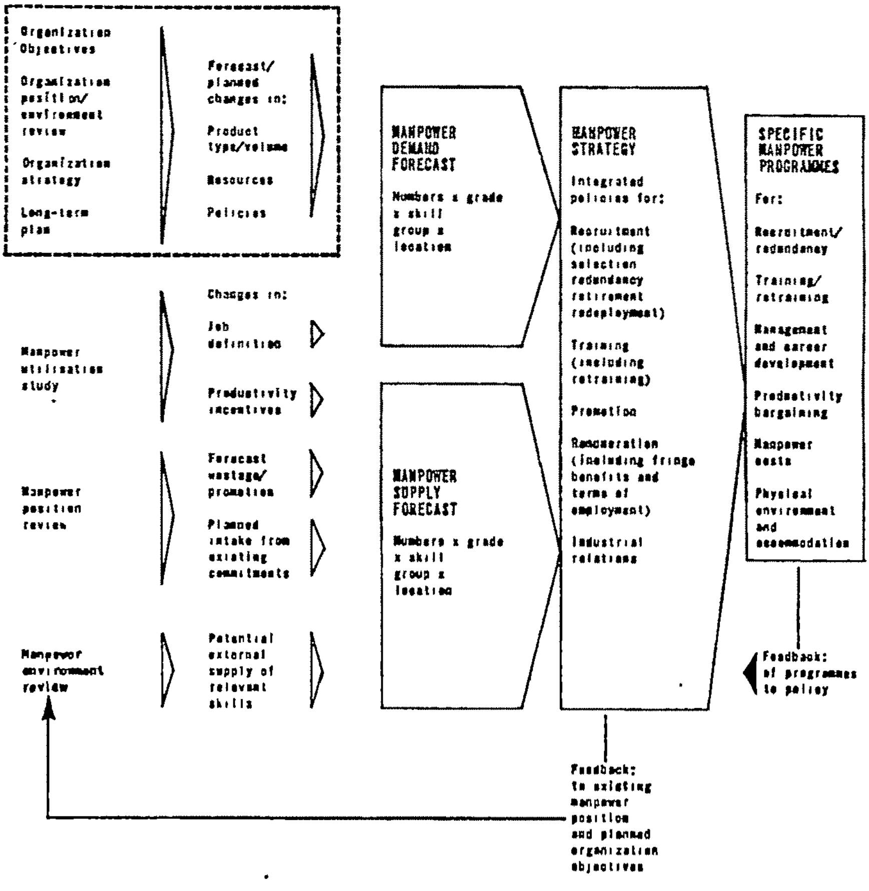
The widespread introduction of effective manpower planning practices would in themselves improve the efficiency of the library services of this country. Since they would enable library authorities to make early identification of courses of training necessary for the achievement of their objectives, they would also influence the provision of courses more relevant to practical requirements. Moreover, national manpower planning—still necessary for the determination of output from initial training courses—would be greatly simplified and would become largely a matter of data collection, collation and analysis.

It is unlikely that this happy state of affairs will ever be reached; certainly it will be many years before sufficient library authorities—public, university and special—are in a position to furnish accurate predictions of their expansion programmes and their future manpower requirements. In the circumstances and with the danger of over-production looming something had to be attempted at national level.

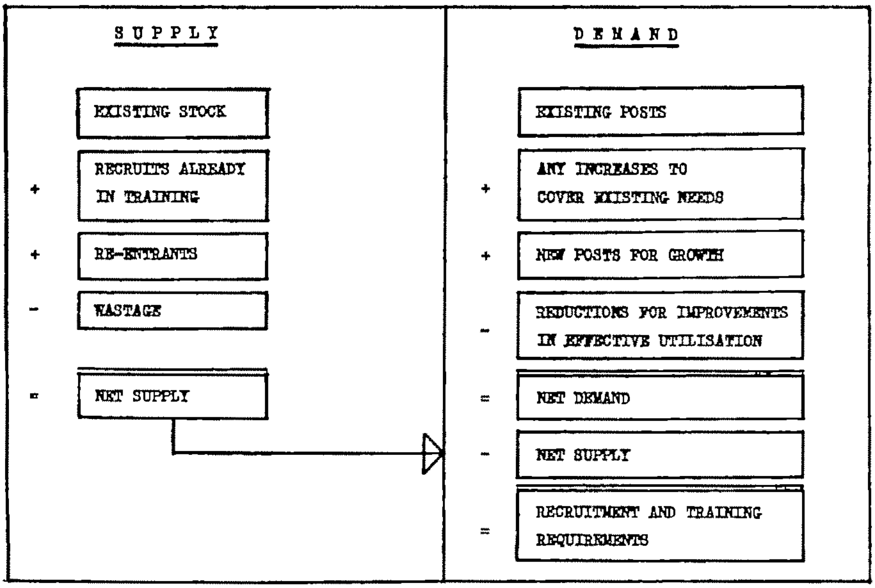
The shortcomings of *The Report on the supply and training of librarians* have already been mentioned, but at least it called a halt to library school expansion and started the official wheels moving. One outcome of this Report was the decision to monitor the output of the library schools and the extent to which students completing courses succeed in obtaining employment. The first of these surveys, which are conducted twice each year to coincide with the terminal examination dates of differing library schools, related to students completing courses in December 1969.[4] The results are published in *The Library Association Record* and more detailed tabulations are made available to heads of library schools and to interested research workers. Efforts are currently being made to improve these surveys—for example an attempt will be made in future to monitor the effects of pre-course experience and the degree of success attained by candidates in their examinations on their efforts to sécure satsisfactory employment. However, though these surveys are valuable as an indication of the state of the labour market and will continue to play an essential role in any system of manpower planning, on their own they are of limited use in predicting future demand, due to the time that must elapse between the start of a course and the employment of its output.

In 1971 therefore it was decided to make a start on the development of a model (or equation) and the collection of data required for manpower forecasting.

A manpower forecasting model


Organization Objectives
Organization position/ environment review
Organization strategy
Long-term plan
Forecast/ planned changes in:
Product type/volume
Resources
Policies
Manpower utilisation study
Changes in:
Job definition
Productivity incentives
Manpower position review
Forecast wastage/ promotion
Planned intake from existing commitments
Manpower environment review
Potential external supply of relevant skills
MANPOWER DEMAND FORECAST
Numbers x grade x skill group x location
MANPOWER SUPPLY FORECAST
Numbers x grade x skill group x location
MANPOWER STRATEGY
Integrated policies for:
Recruitment (including selection redundancy retirement redeployment)
Training (including retraining)
Promotion
Remuneration (including fringe benefits and terms of employment)
Industrial relations
SPECIFIC MANPOWER PROGRAMMES
For:
Recruitment/ redundancy
Training/ retraining
Management and career development
Productivity bargaining
Manpower costs
Physical environment and accommodation
Feedback: of programmes to policy
Feedback: to existing manpower position and planned organization objectives

The diagram reproduced above is taken from an article[5] by B. R. Morris, until recently a member of the Statistics Division of the Civil Service Department. It 'illustrates the broad nature of information relevant to the formulation of manpower strategy, the latter being shown as a balancing operation between the two information streams of demand and supply'. Or to put it in a slightly different way and in a perhaps more readily understood diagram:


SUPPLY
EXISTING STOCK
+ RECRUITS ALREADY IN TRAINING
+ RE-ENTRANTS
- WASTAGE
= NET SUPPLY
DEMAND
EXISTING POSTS
+ ANY INCREASES TO COVER EXISTING NEEDS
+ NEW POSTS FOR GROWTH
- REDUCTIONS FOR IMPROVEMENTS IN EFFECTIVE UTILISATION
= NET DEMAND
- NET SUPPLY
= RECRUITMENT AND TRAINING REQUIREMENTS

The formula is basically simple and it requires little modification to adapt it to the national situation, or to the requirements of an individual organization. The complications arise in collecting data to feed the model. What has been done in this connection?

The national census

The initial step was clearly to try to obtain an answer to the first elements on either side of the equation—the number of existing posts and the existing stock of staff. In 1972 the first ever census of staff employed in librarianship and information work in the United Kingdom was launched by the Department in cooperation with the Scottish Education Department, the Welsh Education Office and the Northern Ireland Ministry of Education. At this stage all that can be said with certainty is that it will be considerably easier to carry out the second census than it has been to carry out the first! The first major difficulty occurred with the compilation of the address lists—comparatively easy in the case of local authorities and education establishments; much more difficult in the case of private industry and commerce. The policy followed was one of using as many relevant address lists as possible and relying on recipients to eliminate duplication and to draw attention to omissions in order to achieve as comprehensive a coverage as possible. One of the by-products of the census will be the creation of the most exhaustive list of libraries in the United Kingdom, and one of the reasons for the delay in producing the results of the census is the efforts made to follow up failures to respond and to eliminate discrepancies and duplications in order to make this list as accurate as possible.

Inevitably—as might be expected with any new project—there have been other snags to iron out. All this has taken time and it is no secret that the census is now running very much behind its original timetable. But when the tables finally emerge from the computer they will provide the answers to the following questions:

(a) The total number of posts for qualified librarians and information scientists at March 31, 1972.

(b) The total stock of library manpower at this same date broken down into:

Graduate librarians and information scientists
Qualified librarians (ALA or first degree)
Graduates without library qualifications
Other qualified staff, such as archivists
Trainees
Other non-manual staff

A fairly complete answer to the data requirements for the first two elements of the model will therefore have been secured. Further, since the census will also provide data concerning the age and the sex structure of the library manpower in the above classes it will also be possible to make a tentative calculation of wastage by retirement and, by the use of actuarial tables, to predict wastage by death.

The effective utilization of staff

So much for the census. Turning now to one of the other elements in the model—an assessment of present staffing levels. Are these adequate? If not, then clearly a plusage factor has to be calculated to allow for their improvement. Are they excessive and will increasing automation result in improved productivity? If so, then there will be some slack in the system which needs to be taken up before calculations are made as to the levels of recruitment required.

It is convenient at this point to digress for a moment and deal with the question of staffing standards, since the research project which is designed to provide the Department with information regarding present staffing levels for the forecasting model is also intended to produce if possible new staffing standards.

The only staffing standards at present generally in force are those commended by the Report of the Working Party on *Standards of Public Library Service*,[6] 1962. It is recognized that these standards, which are based on population served, are somewhat crude and are in any case now in need of further refinement and updating. In their report on *Public Library Service Points*,[7] published in 1971, the Library Advisory Councils draw attention to this need and go on to state:

> Above all, we believe that investigation should be carried out as soon as practicable into the utilisation of staff of different types and qualifications in public libraries. Such an investigation would entail the use of scientific methods of work study, operational research and job evaluation in public library units of different sizes, and serving communities of different kinds. We recommend that adequate resources should be made available for a thorough central investigation into the most effective use of manpower. This investment would effect economies by enabling wasteful duplication of effort at local level to be avoided, and would provide a standard basis from which local, detailed investigation would derive.

Following receipt of this Report and concurrently with the decision to mount the national census work started, in consultation with a number of experienced librarians and management experts, on the preparation of a specification for a research project on the effective utilization of staff in public libraries. The objectives of this research as outlined in the specification may be summarized as follows:

(i) To create a methodology for the study of public library staff utilization based on existing job analysis techniques.
(ii) To produce models or formulae capable of widespread application (within public libraries) in given situations and conditions.
(iii) To determine categories of information required (input data for the formulae mentioned in (ii) above) to enable accurate assessments to be made of local library authorities' actual staffing provision.
(iv) If feasible to recommend revised standards of provision for all types of public library staff.
(v) To attempt to estimate the trained manpower requirements of a public library system, assuming the most effective utilization of staff and to test the standard for general applicability.

The specification was issued to a number of organizations who responded to an invitation which appeared in the *Library Association Record*. Four research proposals based on this specification were received and after due consideration the contract for the research was awarded to the Local Authorities Management Services and Computer Committee (LAMSAC).

LAMSAC's proposal called for over 10 man years of effort spread over a period of approximately 2 years. The project leader is Kevin Graves, a management services officer of wide experience who at an earlier stage of his career had headed an intensive and wide ranging investigation into the staffing of the Hertfordshire County Library. He is assisted by another management services officer working part-time, and by 4 librarian/research officers recruited on secondment from 2 London Boroughs and 2 county library systems. A number of specialist librarians have also been recruited on a short-term basis to advise the project team and to carry out surveys in relation to their specialisms; and a panel of senior librarians has been appointed to whom the project director can turn for top level advice. The project is controlled by a steering committee appointed by the Department on which these senior librarians serve together with representatives nominated by the local authority associations.

The project[8] has now reached a half way stage. Measurement of non-professional work has been virtually completed by direct observation in a wide variety of libraries in a representative sample of authorities, and work is well advanced on the correlation of results. A tentative multi-part formula based on work sources relating to stock, issues, reservations, overdues, etc., has been devised and is almost ready for testing. Using interview techniques data has also been collected, again from a very wide range of libraries, which will enable assessments to be made of professional staff time and surveys of work in specialist fields are under way.

Hopefully, then, when the project comes to an end it will have produced a methodology and a series of formulae which will enable local authorities to assess their own levels of staffing and which will be of value to the Department when carrying out inspections of public library services. Moreover it is hoped that the formulae can be adapted for use nationally and this should provide a sound basis for determining the correctional factors required in the national manpower forecasting model.

Studies still required

It might be useful at this stage to review briefly the work which is still required to produce the data necessary for accurate manpower forecasting.

Clearly, if the staffing research project now being conducted by LAMSAC proves successful—and all the indications are that it will—then it will be necessary to carry out similar exercises in other types of libraries. It will also be necessary to refine the census in order to identify different types of specialisms, to repeat this at regular intervals to up-date the data base and to establish emergent trends, and to extend this to any kinds of libraries that have escaped the net during the first census.

It will also be necessary to launch studies in the following areas:

(a) An analysis of available indicators of growth and expansion, e.g. historical performance, public expenditure forecasts, capital development plans, population changes, etc.
(b) Wastage from library schools, i.e. the difference between the number of students entering the schools and the number which actually emerge with qualifications and enter the profession.
(c) Wastage from the profession and of re-entrants to the labour force.

These two latter studies are likely to prove the most troublesome. Preliminary investigations, particularly those undertaken by the Cambridge Library Management Research Unit, reveal that deficiencies in employment records will make it difficult, if not impossible, to collect the necessary information by historical research.[9] (In this connection it should be stressed that all manpower forecasting is ultimately dependent on the maintenance of full and accurate personnel records.) This being so it is likely that another census type exercise will have to be launched. Since this will involve more form filling and questionnaire completion by librarians some further explanation and details are in order.

Wastage and re-entrants

Reference has already been made in connection with the national census, to *natural wastage* which can be defined as losses of staff due to deaths, illness or disability, and retirement. The key factors involved in predicting these forms of wastage are the age of the stock, and its sex composition. As already noted, utilizing data collected by the national census actuarial tables can be used to predict wastage due to death and illness, and fairly accurate assessments can be made of likely loss through normal retirement. Some element of uncertainty arises in relation to normal retirement due to the practice of allowing personnel to retire voluntarily at (say) the age of 60 or over, but enforcing compulsory retirement at (say) 65. Information regarding the retirement policies of the various institutions will therefore be required in order to make accurate assessments of likely loss through normal retirement.

Voluntary wastage on the other hand is governed by such factors as conditions of work, morale, job satisfaction and job opportunities elsewhere. In the context of the national scene the immediate concern is with losses that arise through employees (i) leaving the profession to seek opportunities elsewhere, (ii) leaving the country, or (iii) leaving for family reasons. There has been a considerable amount of research in the last 20 years on the factors governing voluntary wastage and broadly speaking it has been found:

1. Wastage decreases as length of service and age increases.
2. Wastage tends to be higher among women than among men.
3. Wastage is higher among lower skilled workers.
4. Wastage rates can be affected by the general level of employment.
5. A study of the 'survival patterns' of different groups of employees can provide a satisfactory basis for determining likely loss in the future.

The success of the forecasting exercise will therefore be dependent on the ability to group workers into categories with similar 'survival patterns'. This in turn will depend on knowing:

(i) the age of an employee.
(ii) the sex of an employee.
(iii) the date of entry into the profession.
(iv) whether employed full-time or part-time.
(v) the category of employment.
(vi) the date of departure and destination.

The national census of manpower in libraries and information centres will yield information concerning the total number in different categories of employment. It seems desirable that this should be followed up by collecting data, as outlined above, for all employees leaving the profession. In practice, since the main concern is with trained manpower, this can be confined to:

(a) Qualified personnel.
(b) Unqualified persons occupying posts designated for qualified staff.
(c) Trainees.

It may also be desirable to subdivide these categories further into graduate and non-graduate, since it is likely that graduates will have greater job mobility than non-graduates.

Re-entrants

The high incidence of female employment in the library and information field and the growing tendency for married women to return to service after a break for family reasons make it desirable to study their employment pattern. The Library Association has for a number of years collected data concerning re-entrants as part of its biennial staff and grading census but this relates only to the length of service completed by a married woman between her resumption of work after an earlier break in service and her departure. To make worthwhile study possible it should be possible to answer the following questions in relation to female employees: What is:

(a) The percentage of female employees likely to be affected by a break;
(b) The average length of service before a break occurs;
(c) The average length of the break;
(d) The likelihood of breaks re-occuring and if so at what intervals?

If it is accepted that an attempt should be made to collect the information necessary for a study of wastage and re-entrants on an annual basis rather than by undertaking historical research then this might best be achieved by devising a suitable questionnaire which can be distributed in bulk to employers with a request that they should be completed by all employees in specified categories when they leave the service and—in the case of female employees—when they re-enter the service after a break. This method would avoid any considerable work load falling on the employer's shoulders—his responsibility would be confined to ensuring that the forms are completed and returned to the Department annually for analysis.

Control of output

The long term objective then is to devise a sophisticated manpower model and to feed it with a regular flow of accurate constantly updated information, thus enabling a reasonably accurate prediction to be made of the desirable level of intake into library school courses of all kinds. This is not an easy task, particularly in view of the comparatively small numbers involved and though, hopefully, these objectives will eventually be successfully attained it would be foolish to pretend that this is likely in the immediate future.

However, as the various projects mature the flow of data should make possible increasingly accurate assumptions concerning the number of librarians required. The question then arises of how to ensure that the output of the library schools matches this requirement. How can the twin evils of under production (with consequent unacceptable reductions in efficiency in the provision of library services) and over production (with equally unacceptable losses of financial and human resources) be avoided?

These objectives are difficult enough to achieve in countries with centrally planned economics and social systems: they are even more difficult in free societies, in which responsibilities for services, recruitment, training and education are spread over a wide variety of authorities, institutions and organizations. In this connection, the gradual withdrawal of the Library Association from its monopoly position in library education, though it has introduced a welcome enrichment, variety and much needed experimentation into library school curricula, does to some extent exacerbate the situation. Thus, though the Secretary of State has a responsibility under the Public Libraries and Museums Act 1964 to promote the efficiency of the public library service, responsibility for provision rests with local authorities and the Secretary for State has to exercise her influence through exhortation and persuasion—and she has of course no authority whatsoever throughout private industry and commerce.

She does however have rather more direct powers in the field of education itself and it is perhaps worth reviewing these in relation to library education.

Thus the introduction of new courses in librarianship in colleges of further education and polytechnics have to be approved by the Secretary of State. The Department, including the Office for Scientific and Technical Information (OSTI), with its special concern for information scientists, also appoints assessors on the Council for National Academic Awards (CNAA) and therefore has some say in the validation of new degrees in librarianship.

Similarly the University Grants Committee, when considering the release of funds for the introduction of new courses in universities, will have available to it advice emanating from the Department about the provision of courses in non-university institutions such as that which was issued following the publication of *A Report on the Supply and Training of Librarians.*[10] Moreover the Department through its Awards Branch directly controls the numbers of postgraduate bursaries. If all this sounds somewhat negative it must be remembered that influence can be exercised not only quantitatively to prevent the introduction of unnecessary courses, but also qualitatively to encourage the reappraisal of provision in the light of evolving needs for changes in content. OSTI, for example, takes the view that one of the most effective ways of disseminating the results of research is to involve teachers of librarianship. One may cite the OSTI sponsored seminars that have been held on the use of computer based simulation games in library management[11] and on the Schur Report.[12]

More generally, as the results of Departmentally sponsored research become available, thought will need to be given to the best means of ensuring constructive dialogue between the Department, the library schools, the Library Association and those who employ the products of education for librarianship. The gradual withdrawal of the Library Association from examining and the resultant diminution in its role as the dominant force in education for the profession, to which reference has been made, has already resulted to some extent in a loss of a national focal point. This fact, and the need to find a replacement, are now widely recognized. Solutions will be more difficult to find. Mention has already been made of the initiative of the Library Advisory Councils which has resulted in action being taken to refine and update the standards for staffing and to pursue the question of determining the high level manpower requirements of the profession. It would be logical for them to pursue this initiative by reviving their interest in the training of librarians—an updating of that part of their *Report on the Supply and Training of Librarians* which dealt with training to include new developments such as the growth in training facilities for information scientists.

Alternatively it might prove desirable and possible to revive interest in the recommendation contained in that same Report for a standing conference on library education and training. It must be emphasized, however, that such a step would require a distinct policy decision, and such a decision may well be dependent on the availability of the necessary manpower forecasting data.

Certainly some means is required of keeping needs, and the ways of meeting them, under close review, and this is particularly true in the provision of short courses and retraining facilities. The Department's Committee on Short Courses performs a useful co-ordinating function in this field chiefly through the medium of the *Directory of Short Courses*[13] and, more recently, by monitoring the OSTI sponsored Aslib research project on the provision and assessment of short courses in librarianship and information science.[14] One of the great growth sectors in the library education field in the next decade is likely to be in the provision of re-training courses. The need for such facilities was mentioned in the Department's recent circular in connection with the reorganization of local government,[15] but the need is not only specific it is continuing and means must be found of meeting it.

In doing so the employer—the consumer of the products of the education system—must, as already indicated, not be forgotten. Library schools frequently find themselves criticized for failing to turn out librarians with the required skills and attitudes. This criticism is often unjust and it should be remembered that the existence of users' advisory committees by library schools is widespread. Nevertheless a place must be found for the employer in any general reviewing mechanism. Employers have to some extent lost control over recruitment to the profession and to a large extent over the type of training provided. Means must be found to ensure that the new agencies of recruitment and training are responsive to the requirements of the service; for in the long run, whether one is discussing manpower planning, staffing standards, or education and training, one is talking about the provision of the quality and quantity of staff required to enable a comprehensive and efficient service to be provided.

REFERENCES

1 A Report on the supply and training of librarians. HMSO 1968.

2 Company manpower planning. Manpower papers No. 1. HMSO 1968.

3 Aspects of public library management. Library Information Series No. 3. HMSO 1973.

4 Survey of library school students completing courses during December 1969, by D. W. G. CLEMENTS. *Library Association Record*, 72, 9, September 1970. Similar surveys have since appeared at regular intervals.

5 An appreciation of manpower planning, by B. R. MORRIS. *O and M Bulletin*, 25, 3, August 1970.

6 Standards of public library service in England and Wales. Report of the Working Party appointed by the Minister of Education in March 1961. HMSO 1962.

7 Public library service points. A report with some notes on staffing. HMSO 1971.

8 LAMSAC's library research project by KEVIN GRAVES. *Local Government Chronicle*. April 6, 1973.

9 Verbal communication.

10 The future supply and training of librarians. Circular 6/69. Department of Education and Science, 11 April 1969.

11 Computer aided instruction in scientific and technical information systems management. Final report. The Library, University of Lancaster. August 1972.

12 Education and training of information specialists for the 1970s. Report of a study for the organisation for economic cooperation and development, by HERBERT SCHUR. Postgraduate school of librarianship and information science, University of Sheffield, January 1972.

13 Directory of short courses in librarianship and information work. Department of Education and Science. No. 1, January 1968.

14 Short courses provision and assessment in the information/library field, by MARGARET SLATER. To be published.

15 Local Government re-organisation and the public library service. Circular 5/73. Department of Education and Science and the Welsh Education Office. 29 March 1973.

Fundamental problems of information transfer

A. W. Pearson

Manchester Business School

Paper presented at the 47th Aslib Annual Conference, University of Bath, 23rd–26th September 1973

IN THE PROCESS of preparing a paper which would do justice to the chosen title one becomes very conscious of how difficult the subject with which we are dealing is, and how little we know and have actually measured about the way in which information is transferred, stored and subsequently utilized by individuals, groups and organizations.

It would therefore be very easy merely to open up discussion by introducing one's own particular prejudices and following them up with a debate which simply reveals those of others, and as they are likely to be different, this will probably lead to a friendly agreement to disagree, but not to any action.

I have therefore chosen not to do this, but to approach the subject by looking first at two areas which I consider have something to contribute to our knowledge of the problem solving process and to some research which helps us to understand the way in which information is utilized in this process. The two areas I have chosen will not surprise many people—they are those of communication and of creative analysis, and my interpretation of the research in those fields leads me to believe that it is 'needs' which are the major determinant of the use and hence value of information.

Further analysis of this phenomenon suggests that these needs are influenced by the individual researcher, by the group of which he forms a part, and by the nature of the organization in which he is employed. These three factors affect the value of information, and as they each have characteristics which may differ with time it can be argued that information has a value which will vary with the time at which it is received. As the latter will inevitably be a function of the time at which it was disseminated, it can be argued that there is a major requirement for those at the centre of the information system to become more aware of and closely involved with the environment outside their own function.

This has, of course, already been accepted in many organizations and has raised many questions about the role of the information scientist *vis-à-vis* the researcher—a 'who does what' problem, if you like. It also raises the question of the balance of resources between researchers and support staff, but the more fundamental and important questions are concerned with the form which this interaction should take, and on this we are rather short of information. It can therefore be argued that we need some research. The lines which this might take are suggested, although the means of obtaining measurements are not altogether clear. These suggestions are based on assumptions about the information transfer and utilization process which may not be accepted. These assumptions are therefore discussed before some final, if only tentative, conclusions are drawn—but first, the relevant parts of recent research.

Communication patterns

The majority of this work has been undertaken in a research or research and development type of environment. Much of the pioneering effort took place in the United States in the 1960s, and the most commonly quoted is that described by Professor T. J. Allen and his colleagues at M.I.T. One of the most emphasized parts of this work was the effect which geographical distance had upon the 'probability' that any two researchers would communicate with each other. This is clearly shown in the graph which is reproduced from one of Professor Allen's articles on the subject.[1] Other features which were also found to be of importance were the existence of informal as well as formal networks of communication and the finding that certain people, later labelled as 'technological gatekeepers' played a major part in the information receiving and subsequent dissemination process. It has never been entirely clear how one can identify such people in advance, whether their role is permanent or transient, and whether

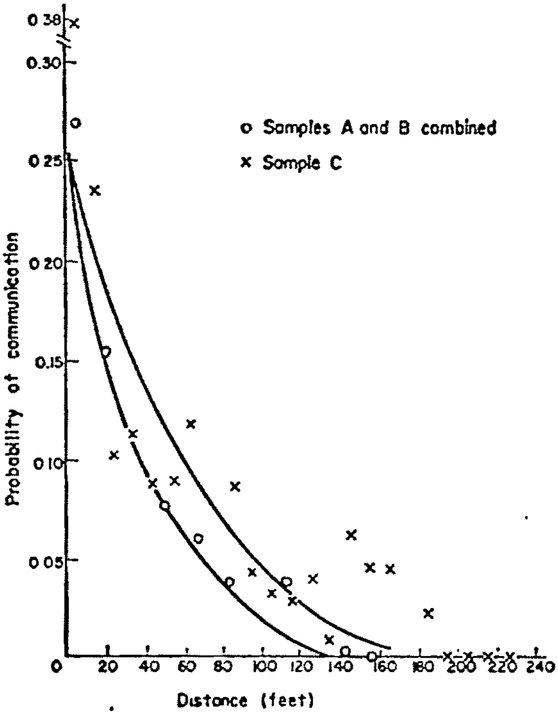
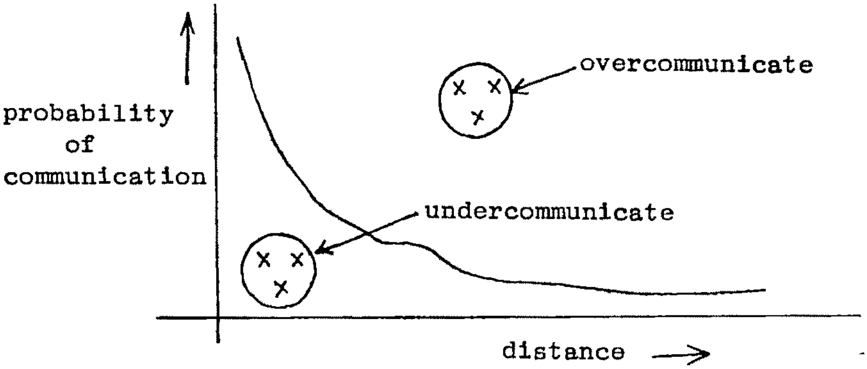


FIG. 1: *Probability of communication as a function of the distance separating pairs of people*

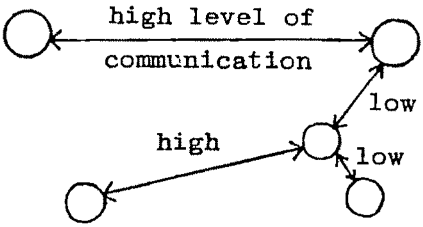
or not their positions can be formalized. Sufficient to say that the impact of this early work has caused many organizations to rethink the layout of their laboratories and to consider, if not adopt, a system in which gatekeepers are specifically identified and labelled as such for all to see.

Other organizations have made less dramatic changes, and some have even undertaken research to see whether the same situation applies in their own laboratories, and if so, under what conditions. Much of this work has been undertaken in the U.K. and the results have suggested that the geographical distance phenomenon is not so important when a group of people are working on a similar problem which has common goals, and where the 'need' to communicate is apparent. This has been noted in a number of studies, and has been reported in the literature.[2] At the same time, in a study of the communication patterns between scientists in different types of institution over a whole country, it has been found that geographical distance is not the major determinant of frequency of contact between researchers.[3] Certain people seem to overcommunicate and others undercommunicate, and hence their location on the graph is away from the general trend.

For example, in the case of a single laboratory the following might apply



and for a number of laboratories or different institutes



This recent work does not invalidate earlier findings. It suggests that geographical distance can be important for encouraging informal communications, (hence the argument for creating central washroom facilities and coffee areas, or for running conferences such as this), but that formal communications can be established over comparatively long distances when people are working towards common goals and have common interests. If this is accepted then the importance of 'needs' as a stimulant to information transfer begins to become apparent.

However, any discussion of 'needs' must involve a consideration of a number of factors, in particular

(a) there must be a willingness of people to communicate, or perhaps to be more explicit, it may be that the needs as seen by an individual are not the same as would be seen by a group or organization. There are plenty of examples which could be quoted where this would be true, for example in a competitive type of environment either in industry (or even in universities) people may be unwilling to communicate with others either from an unwillingness to share their knowledge or perhaps from a desire to suppress their lack of knowledge;

(b) there must be an awareness of where the knowledge is located which might be relevant to the needs, and this can be a difficult problem. To whom, where can one go for information? The answer will frequently be to those sources with which one is familiar and which have perhaps been rewarding in the past, but this can be very restricting, as we shall argue in the next section;

(c) there must be a degree of understanding between the parties who exchange information about each other's state of knowledge and problem areas. If this is not so, it may well be that nothing of value is transferred. Examples of this can be cited from areas such as the interface between different functional areas, e.g. R & D and Marketing, and between different types of institution, e.g. universities and industry. In many cases papers are published, memoranda are issued and exchanged, but very little happens because of a lack of understanding between the parties. This may be simply a function of the method of presentation, (i.e. the heavy use of specialized jargon) or it may be an inability of one party to see the potential value of work outside his own special field of interest.

Finally, we must bear in mind the role which apparently irrelevant information plays in the process of problem solving, something which has been brought out frequently by those concerned with the many forms of creativity training.

Creative problem analysis and solution

Under this heading a number of techniques for improving the problem solving process have been developed and tested. Some are fairly well-known and established, such as brainstorming and synectics, while there are others which have not perhaps had as much publicity, or are not as formalized, but which have been successfully applied.[4,5]

The effective utilization of these methods often requires a high degree of skill, particularly on the part of the leader, and it is not possible to describe them in any detail here. However, some of their major characteristics are of importance to those responsible for information transfer. For example, they tend to emphasize the role of the group rather than the individual, and the sessions are conducted in such a way as to encourage group activity and positive progression, with ideas building upon ideas in a fairly rapid fashion, and little (if any) attempt being made to evaluate individual ideas as they are produced. In brainstorming this is particularly so, and the separation of generation from evaluation and the operation of the principle of deferred judgment are basic features of the method.

Another important point which is always considered in the operation of such methods is the composition of the group. Who should be included and what type of people? It is generally accepted that the members should have a variety of backgrounds; the mixing together of R & D people with marketing, production etc., is to be encouraged in many problem areas. In addition, it has been found valuable on many occasions to include non-specialists, sometimes people who might be associated with the problem at a future date, but also secretaries, housewives and others whose potential contribution in such situations would not normally be thought to be worthwhile. One reason for this is the way in which the group is organized and the way it is able to make use of intermediate, (and perhaps considered at the time to be irrelevant) information to enable the group to move forward to a new approach. The use of the 'intermediate impossible' and the general principles of lateral thinking are now widely known, and have been much publicized.[6]

The success of these methods in a wide variety of problem areas suggests that we should pay considerable attention to the role which non-specific information plays in the problem solving process, and that there may be many occasions on which such information is likely to be of more value than that which is most likely to be available or to be requested by the individual. This suggestion could certainly be substantiated by many of the studies of the innovation process[7] where it has been found that ideas from outside the normal work environment have proved to be of most use in stimulating the innovative process. The transfer of information by people moving between organizations and into different environments is often cited as a particular case. It could also be argued that the 'technological gatekeepers' are so successful because they tend to read widely and are able to see interrelationships and potential uses for information in many areas. And, of course, they would appear to be able to store information they have acquired and retrieve it at an appropriate time in the future when it can be put to use. This raises two questions—firstly, are these people unusual in being able to handle variety as well as quantity without suffering an overload—because overload must inevitably lead to rejection of part, if not all, of the information which is received? Also, are these people unusual in having a retention and retrieval ability which is superior to others, and which coupled with their ability to handle variety makes them an essential part of any information system?

The 'Sieving' of information

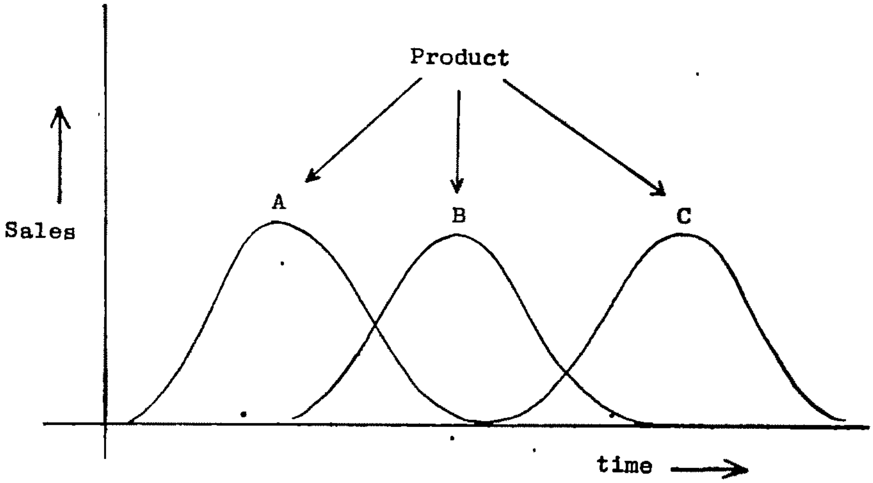
Individuals when confronted with information make decisions about whether or not to accept it into their personal storage system for a variety of reasons. An obvious one is the degree to which they are already loaded, or even overloaded, and simply find it impossible to cope with anything additional. Too high an overload can result in rejection, if only for a short time, of all information, not just that which is of marginal value.

They can also reject it because they do not see it as being relevant to their present activity. This may well be true, but there are many situations in which benefit could be obtained by a more careful examination of its content. One often hears, for example, of comments being made about people's ideas such as 'it won't work', 'we have tried it before', and one is well aware that people pay less (in some cases *no*) attention to information coming from sources they do not consider to be knowledgeable about the problem. This has been briefly discussed earlier, and it was argued that some of the techniques used in the field of creativity training have been specifically designed to overcome some of these attitudes. It has also been established that researchers do not specifically look for alternative solutions and/or new information when their present work is progressing at an acceptable rate, even when there is a possibility of introducing change which could be advantageous.[8]

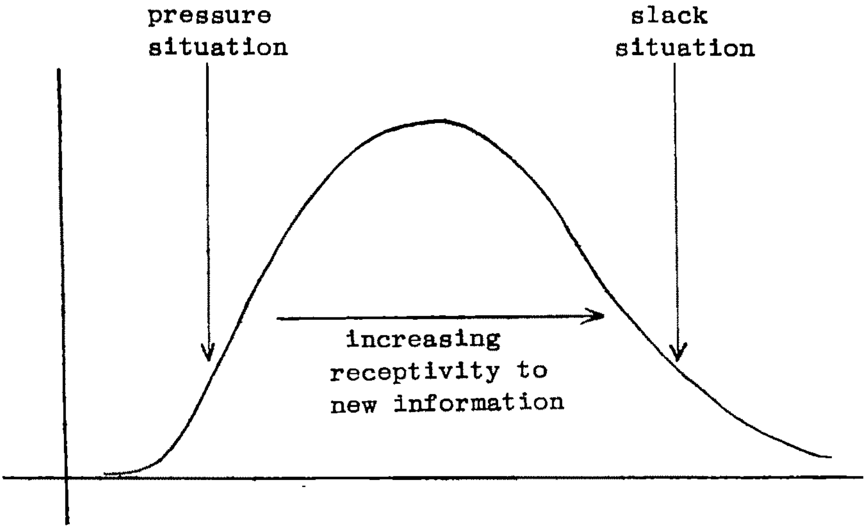
The conclusion one can draw at this stage is, therefore, that information does not have an absolute value, but one which is very much dependent upon the time at which it arrives at the potential user, and this is a function of the state of the activity with which the individual is currently concerned. This point is emphasized if one considers also the fact that much of the information received by individuals may be more relevant to future activities than to those on which they are presently engaged.

The 'time value' of information

To try to illustrate this point, it has been found to be useful to draw on a concept from the marketing area—that of the product cycle.[9] In the extreme case of a small firm with only one major product on the market at any one time the situation might be shown as follows:

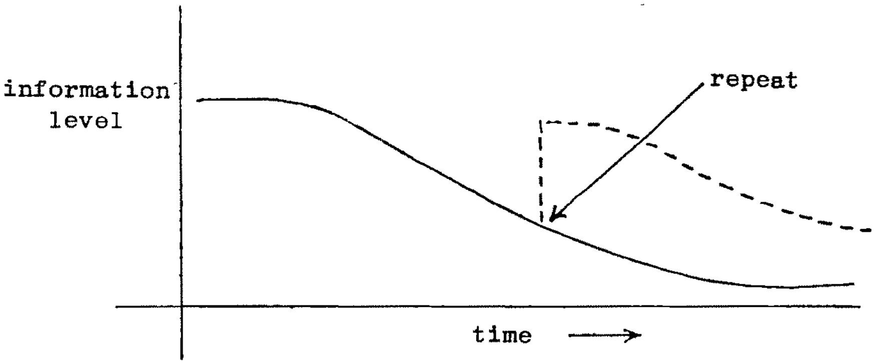


Expanding this diagram and examining more closely the single product cycle it can be argued that the degree of receptivity of the firm to new ideas, or more generally to information which might assist them in formulating future product strategy, will depend upon the state of the present product. A particular case might be one in which the firm finds itself in a pressure situation for effort in the early stages, and hence in a condition when information which is not directly relevant to present needs will be rejected. Conversely in the later stages of the cycle the pressure comes off the existing product and is transferred to a need for new ideas or information seeking phase.



This is clearly an oversimplification and the situation will be different for different organizations, but the point at issue is that if this assumption is correct there will be receptivity to information which is a function of the state of the organization at the time the information is received.

Finally, however, we must take into account the fact that people have a memory and an ability to recall part, if not all, of the information which has been received in the past. This memory ability must fade with time, and the question then arises as to how the fading varies with individuals; for example, is it less for gatekeepers than for others, and how do we identify the characteristics in the case of particular individuals? This is important from the information transfer point of view, because it may be possible to repeat inputs at appropriate intervals to reinforce previous inputs.



This however raises a further question—how frequently can one repeat individual inputs, while also introducing new inputs, and not produce a saturation condition? Two points merit consideration here. The first is the requirement to identify the way in which different people are affected by information overload and at what level this condition sets in. The second point is the possibility of identifying more closely the needs of the individual in respect of his current and future work, which might be helpful to the information scientist in attempting to more nearly match the flow to these needs.

Conclusions

It has been argued that there are a number of factors which affect the value of information and hence the degree to which it is utilized in any given situation. It has been suggested that information has a time value and that this is affected by the personal characteristics of the individual who receives it, by the state of the activity or project in which he is currently engaged, and by the state of the organization in which he is positioned.

It has also been argued that it can be valuable to provide more information, or more particularly a wider range of information, as inputs to projects than would necessarily be seen as being of direct and immediate relevance, but that this can easily lead to an overload, and perhaps lower utilization, situation. It has been suggested that this problem might be overcome by the use of more group interaction along the lines developed by those concerned with the creativity training area, but this is not the only answer and some attempt must be made to utilize the more normal communication channels to promote information transfer. It is suggested that this might necessitate a closer involvement of the information scientists with the total environment, both within and external to the organization. In fact, some progress along these lines has already been made by a number of organizations. The major question then raised is whether or not the information scientist is really taking over much of the responsibility of the individual researcher, and whether he can perform this duty adequately over a wide range of activities. It also raises the question of the balance between researchers and support staff and the effectiveness of the overall activity with which both groups are concerned, i.e. assisting the organization to achieve its goals.

At the present time it does not appear that we have enough information to assist us in this task and therefore it seems sensible to look at the next stage of the development of an effective information system as a research project in itself. If this is possible, and the arguments put forward in this paper are accepted, it is suggested that effort should be concentrated on activities which will help us to understand more about the way in which different individuals react to information, particularly that of a non-specific nature. Also how this reaction varies with the state of the activity with which the person is concerned and the way in which this state is likely to change in future time periods, bearing in mind that this will be influenced by the type of work on which he is engaged. In particular, it will vary between, for example, people engaged in research of an exploratory nature and those in the development area.

The final requirement is to identify the needs of the organization itself over future time periods in an attempt not only to anticipate them, but bearing in mind the time value argument, to ensure that information is not wasted by being disseminated too early as well as too late. The above of course is ambitious, and the ways of obtaining data which would be helpful are not altogether obvious at this stage, but such a programme of research must be a worthwhile and useful contribution to our knowledge of the information transfer process.

REFERENCES

1 T. J. ALLEN, Communication networks in R & D laboratories, *R & D Management*, Vol. 1, No. 1, October 1970.

2 V. M. WALSH and A. G. BAKER, Project management and communication patterns in industrial research, *R & D Management*, Vol. 2, No. 3, June 1972.

3 T. J. ALLEN and S. COONEY, Institutional roles in technology transfer: a diagnosis of the situation in one small country, *R & D Management*, Vol. 4, No. 1, October, 1973.

4 T. RICKARDS, Brainstorming in an R & D environment (1969–72), *R & D Management*, Vol. 3, No. 3, June 1973.

5 H. GESCHKA, G. R. SCHAUDE and H. SCHLICKSUPP, Modern techniques for solving problems, *Chemical Engineering*, August 6th, 1973, pp. 91–98.

6 E. DE BONO, *Lateral Thinking for Management*, McGraw Hill, 1971.

7 J. LANGRISH *et al.*, *Wealth from Knowledge*, Macmillan, 1972.

8 T. J. ALLEN, Managing the Flow of Scientific and Technological information, Ph.D. dissertation, M.I.T. Sloan School of Management, 1966.

9 C. S. MORPHET, A probabilistic model of some factors governing the acceptance of random innovative ideas by industry. Internal report of the R & D Research Unit covering a research project supported by the Programmes Analysis Unit, a joint unit of Dept. of Trade & Industry and U.K.A.E.A.

DISCUSSION

MR R. SEWELL (British Steel Corporation), commenting on the speaker's reference to the possibility of forecasting the point at which specific items of information would be repeated, while avoiding overloading the system, said that one method which had been used for years in his own organization was that of circulating minutes of scientific and technical committee meetings to the information staff. One possible objection was the difficulty of persuading management that information staff needed access to the minutes. MR PEARSON agreed the value of this method but pointed out that the information staff had to know a great deal about what was going on in order to understand the minutes: the distinction between information worker and research worker was sometimes blurred.

MR H. R. ASTALL (N. Staffs. Poly.) asked the speaker to comment on the importance of the form in which information was transferred, to which MR PEARSON replied that the most important characteristic was that the information be understandable, so that the recipient would be able to recognize its relevance to problems and understand its value.

MR R. G. GROEGER (John Laing Ltd.), said that his own experience suggested that the speaker's model of the new project cycle was an over-simplificaion. At the pressure area peak of the curve, especially if the peak were prolonged, there was often considerable readiness to accept new ideas and information, but that in the 'slack area', although there might be receptivity to new ideas, their acceptance was likely to be very low. MR PEARSON said that what he had been trying to imply was that there was a need to identify 'pressure' and 'slack' areas and how they varied over time in an organization. Undoubtedly the pattern would vary in different organizations.

MR K. C. WILSON (ICI Petrochemicals) pointed out that the speaker's comments on memory had implication for awareness. This had a 2-level value, first that of providing information of immediate applicability, secondly that of arranging a general background awareness of the nature of the content of the information system. MR PEARSON agreed that the goal was to give people a wider range of knowledge that they could make use of themselves without overload, and to give a general feeling for information which they will over time digest and assimilate, and from which they will derive new insights.

MRS N. E. ORNA (Engineering Industry Training Board), said that there was a need for user education in interaction with information services, building up knowledge in the information service not only of users' interests but also of their methods of work and reactions to information supplied. This not only enhances the service given but also may help to encourage interaction amongst workers in different parts of the organization. MR PEARSON commented that exploration of user needs and uses implied tremendous interaction between users and information workers, and was very much a two-way educational process. There was a need to know what users did when they received (or did not receive) items of information and to see whether, as information input increased, a point was reached at which all input was rejected. If a user's attitudes to information vary over time, it may be possible to identify the best input time. T. J. Allen's parallel R & D proposals study was an example of a study in this area, but there was a pressing need for more research to be carried out.

MR. O. N. BLATCHFORD (Forestry Commission) asked whether the speaker thought there was a need to educate the organization, and whether he was happy with the management research and its ability to set objectives. In reply, MR PEARSON thought that every one was happier with management's objective setting ability now than they were five years ago. There was more attention paid now to identification of goals and to project definition, and more to the relation of project objectives to overall organization objectives. There was also a greater awareness of the way in which change in the environment in a market sense could influence the progress of a project which emphasized the need for the information scientist to be concerned with the factors outside the immediate need of the research worker.

Information transfer in the industrial environment—the requirements of industry

David Rowe

Kellog International Corporation

Paper presented at the 47th Aslib Annual Conference, University of Bath, 23rd–26th September 1973

I HAVE been asked to talk from the business-man's angle. My sole experience of information services has been as a non-scientific user. I know nothing of the theory of information science and obviously I am in actual danger of re-inventing the wheel.

However, as a user I hope I will have some value as a guinea pig. What I say should at least help to air whatever may be the average non-technical managers' conceptions and misconceptions about information services.

I also want to emphasize that I am talking about the role of the information service as a businessman sees it. Not about the problems of communication in business as such. I could not do the latter without the benefit of the kind of profound psychological studies which Mr Pearson has just treated us to.

As a businessman looking at the information business I suspected ever since I started thinking about this paper that there is a fundamental difference between the information needs of scientific research workers and businessmen. As between scientists I suppose it is understood that there is a corpus of scientific information and that the object of science is the extension and manipulation of this corpus. In this context I can see that the service which a research worker requires is that he must be put in possession of virtually everything that has been published in whichever language bears on the specific work which he is undertaking. And yet this must all be presented in an assimilable form. Otherwise he will follow up avenues that have been shown to be unproductive or 'discover' processes which have already been invented. I imagine the same requirement for virtually all the published literature arises in connection with the 'prior art' searches carried out in the patents area. Now, with the benefit of Mr Pearson, I know that overload.

The businessman, on the other hand, does not need to know and does not want to know and does not need to keep in such intimate touch with management literature unless he is in the management business. He is not operating in a field where a prime objective is the extension of knowledge or discovery or innovation. The ground rules are much harder to establish but at the same time the methodology of the information officer is likely to be no less exacting.

Turning now to the non-scientific information required by businessmen the thing to strike me hardest is the amount of competition which the Information Officer has to contend with. He is not a focal point like his scientific colleague.

We are all in the information business—accountants, lawyers, market researchers, salesmen, personnel managers, computer people. And this is quite apart from the journalists, broadcasters, *The Sunday Times Business Supplement*, bombarding the poor businessman with information all the time. Indeed the bulk of the information a manager requires to run a small business comes, and rightly so, from his accounts department, his salesmen and the daily papers. As the business becomes larger and more sophisticated he then requires a market research department. However the fact is he can easily get all the information he wants without using an information officer at all.

It is easy to see that the accounting function, backed by its computers, is very much in the information business and practically nothing else. Gathering and processing the internal information of the firm to produce meaningful ratios, throwing up variances from budgets, comparing this year with last year and recording data for taxation and shareholders.

It is perhaps not so readily recognized that the same is true of the other professions or quasi-professions employed around the firm. Almost every professional worker is in the information business in a more or less specialized way. For instance:

- —if my firm wants to know how to set up a subsidiary in Italy they would ask me and I would put together the information after talking to Italian lawyers and accountants. I would not be interpreting information—I would be just finding out and reporting;
- —again if we want new office accommodation our Administration Director would contact estate agents, gather information on prices and availability and report;
- —if a manager wants a write-up on the status of a firm—including say a Companies Registry search—he is perhaps as likely to go to the financial department as to the Information Officer.

This may all sound depressing. I have one further point to help put the role of the information officer in context. I believe the primary role is to supply information from published sources and to supply it, not interpret it.

I asked a friend of mine who runs a market research department to distinguish between the work of an information officer and a market researcher. He had no doubt that the difference was that the researcher applies interpretation and judgement to the information he receives. He gave an example. If you ask an information officer for the refining capacity of Western Germany he will tell you that such an article quotes figure x, another article figure y, plus the official statistics. The market researcher will give one figure backed up by his reasons.

I do not think this is entirely right but it obviously must have a lot of truth in it. I would be interested to know what members of the audience think.

At any rate it leads to the next thought that by and large in business an information officer is a supplier of information to other intellectual workers for further processing. He is not a supplier of information to management for decision-making. The clients of the Information Officer do that.

Because I have stressed this competition point and the role of other intellectual workers I may be thought to have suggested that industry does not need information services. Nothing could be further from my own view. In fact I believe that a really good commercial information service is a mark of an efficient and forward looking company. I know some firms do without. To my mind they are seriously penalizing themselves.

The information officer is the master of sources of published information. I know that evaluating and finding one's way around these sources becomes a more and more specialized job. The sheer rate of change of the commercial environment emphasizes the need for a specialist to monitor and abstract everything published which is relevant to the success of the firm.

In our firm we have as a planning objective—'To maintain a continuous system of surveillance of our changing environment and to analyse its effect upon our business as related to:

(1) our own and industry trends
(2) marketing intelligence
(3) competitive intelligence
(4) government regulations and actions'.

The responsibility for this is centred in our planning department but its day to day execution is concentrated more in the hands of the Information Officer than anyone else.

Our information officer produces as a by-product of his surveillance activity a weekly abstract of the news which affects the day-to-day operation of the company and its future. I want to stress that all the senior managers in our company derive great benefit from this straightforward weekly abstract. It means that once a week you can give yourself a 5-minute crash course on the week's news, so far as it matters to a process plant contractor, and the rest of the time you can read the daily papers in a more relaxed way. It doesn't matter if you miss a day. As Information Officers you should not allow yourselves to undervalue the real benefits that such a simple exercise, for you, can bring to the executive in industry, or indeed the valuable publicity it brings to the department.

To summarize at this point, the requirements of industry for non-scientific information are vast; that the requirements of decision makers are for processed information; and that the bulk of all this is gathered and processed by accountants and others. The information officer has a particular niche in all this activity as the person who operates on the published information concerning the firm's external environment. This job is not primarily to interpret or pass judgement so much as to make the information available in an assimiliable form to others in the organization who in turn produce the briefs for decision-making. He is not producing for innovation.

What now are the requirements which users of an information service would like to have? What are they looking for in the information service?

1. In our organization the primary function of the information centre is developing and maintaining a library of cuttings and other material in accordance with a classification with a strong marketing and planning orientation. Indeed our information centre is part of the marketing department.

> I think this is right. Without this function we would not be able to justify the Centre. However it is difficult to say very much about what the user department is looking for. Essentially if the marketing man is interested in, say, the likely demand for phenol plants, he wants to be able to pull out a file labelled 'phenol'. Then of course the information officer must have a network of personal contacts so that he can draw on other people's files if his own are lacking.

But all this is your business. I believe that all I can do is to indicate what I and my colleagues would like from individual requests for information.

1. We recognize, or ought to recognize, that most of the time we don't ask the right question or we ask a diffuse question. We need the Information Officer to pin us down and clarify our intention.
2. To do this the Information Officer must have a good understanding of the overall business and the individual manager's role in it.
3. We want a fast response:
   (a) because all human beings do;
   (b) because we want to know as quickly as possible whether you have enough of the right type of information or whether we will need to resort to a fuller enquiry;
   (c) because the response confirms whether or not the Information Officer is on track. If further work is then needed it is possible to adjust the direction of the search.

It can be both embarassing and unproductive to receive a tremendously detailed response which arose out of a misunderstanding.

I believe any information officer who meets these requirements will be much in demand with his colleagues.

But these requirements and particularly that of defining the question and understanding the business of the company raise the questions of judgement and experience. It is obvious, but I believe worth saying, that the longer an information officer is with a given company the more valuable he becomes. In time he becomes an expert on his company and its business. And obviously as this stage is reached the greater interpretation and judgement goes into the answers he provides.

I just ask the question—'When does this function cease in effect to be that of information officer and become something else—counsellor or market researcher?'

In closing I wish to make two more points.

> I can see that in some disciplines or professions the controlling of the basic information which the members of the profession have to know is reaching a point where outside help is required, just like the information scientist in the field of scientific research. The profession I am thinking of in particular is law.
>
> The rate of change here is becoming staggering—the last two years have seen the Industrial Relations Act, the Counter-Inflation Act, a revamp of the tax

system with the introduction of VAT, the Fair Trading Act and many other important acts supported by innumerable statutory instruments and shortly we are going to have a new Companies Act.

With a multinational company one then has to transpose this into an international context. Take for instance the applications of EEC regulations to UK Company Law.

I find that I am increasingly using our Information Officer to assist me in this area. I am sure this is a field with growth potential.

Finally—a good manager is an inquisitive manager. And a good business is one which is always searching for opportunities. Whilst this is the case, the future of those who minister to a manager's inquisitiveness is secure.

The place of the information service within the organizational structure

B. Yates

Pilkington Brothers Ltd

Paper presented at the 47th Aslib Annual Conference, University of Bath, 23rd–26th September 1973

Introduction

I WAS asked to say something about the place of the information unit within the organizational structure and it was suggested that in making my contribution I should consider three particular areas: status, lines of communication between the information unit and other parts of the organization and relationship with management.

I have tried to arrange some ordered thoughts on these topics both of a general nature and with specific examples. It is not suggested that the examples can be taken out of their particular situations and used elsewhere without further consideration, but rather that the methods of evaluation employed in these situations are worthy of consideration when an information unit is being planned, reviewed or developed.

No doubt many of you are familiar with systems thinking and the systems approach and I consider that the information unit must be part of the total information system of the company, it must be part of the trunk of the tree not just a branch which could wither and die for lack of nourishment. Information units in these branches can of course fulfil a useful role but their remoteness from the main channels of communication in the company mean that they will never be able to fully contribute to the effectiveness of the company as they could and should. If you have an information unit operating only for research and development when on the same site, or fairly adjacent, are production, planning, marketing and other functions then though the unit is doing a good job for R & D it could most probably do a better job for all the functions.

If the information unit is considered as part of the company information-communications system then it will receive as a right all signals about the company's long term plans, and the medium term plans of all the company's functions. Once it receives these signals then the unit is in a position to plan ahead and to anticipate the needs of the company.

So my overall criteria, if I can sum up before I start, is that the place of the information unit must be where the information is most meaningful.

If all of us here need a banner to follow to ensure that information units achieve their rightful place in an organization, then perhaps that banner should read 'information is the right lubricant for the right action'.

In considering the place of the information unit let us try to trace a path between ideas and action. I suggest this is useful because the most effective organizations are those who are geared to turning useful ideas into actions most quickly.

Look at the following progression

Observation + thinking → fact
Fact + understanding → information
Information + sharing → communication
Communication + mutual understanding → interaction
Interaction + trust → common objectives
Common objectives + action → progress

You will see from this that information has a part to play in turning ideas into actions, but only a part. There are other factors involved and the information unit must play its part in ensuring the effectiveness of these other factors if the information it provides is not to be delayed or diluted.

Think of the avenues for the unit to influence understanding and action and relate these to the place of the unit in the organization. For example to ensure understanding information must be in the right form at the right level and to stimulate action information must be appraised with regard to its importance.

Now situations differ and there will be constraints as to how much influence an information unit can bring to bear on any of these, not the least of these constraints could be the internal political situation in a company at a particular time. Nevertheless I feel that the information unit will never find its true place until it asks itself 'what should we do to ensure action as a result of information we provide?'

Figure 1 brings us back to my central theme the information unit as part of the company system. I have tried to illustrate here the interfaces between the marketing, production and technical activities of a company. The centre of the circle is the main board of the company and the radii go through the various levels of the company until they reach the shop floor as represented by the circumference. The area I have marked co-ordination is the area in which I consider the information unit should reside to be most effective overall: in close touch with senior management at all levels.

I am not suggesting that this is the area in which the information unit should act, nor indeed that this is the area in which the information unit should be most active. Far from it. The information unit should be active in the whole area but the intensity of action will vary throughout the area. The information needs of the shop floor are very different, and indeed may lie outside the area of the traditional information unit, than the needs of the shop manager or production controller.

Having provided a conceptual approach to the place of an information unit let me now discuss the three specific points I was given.

Status

We shall be talking about relationship with management shortly and obviously this has some bearing on the status of the information unit.

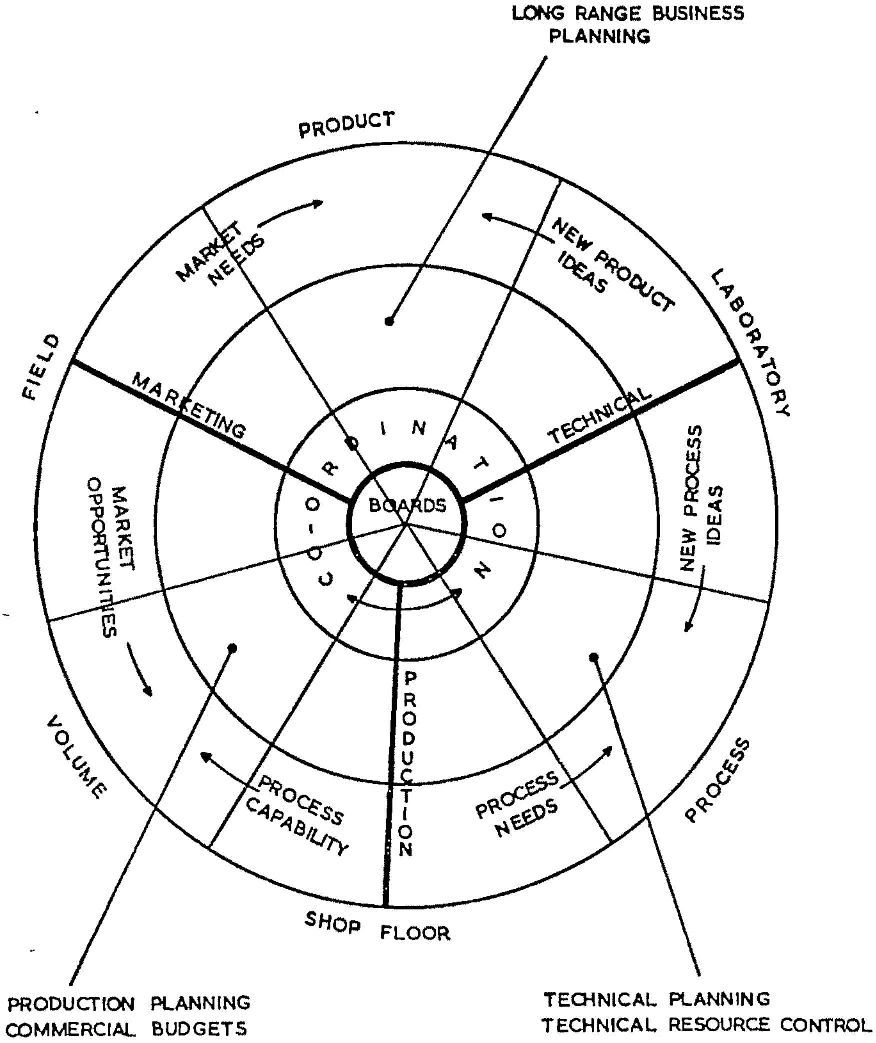


FIG. 1

If a company is just setting up an information unit and the driving force behind the idea to create the unit is a senior director then the unit will be seen to have a certain amount of status. We are here measuring status in terms of recognition at senior level. This status will be enhanced if the unit reports directly to a director.

Is this the sort of status the information unit should be aiming for? Recognition at the top?, or should the status sought come from doing a good job for people nearer the shop floor?

There is a factor here of the 'visibility' of the unit throughout the company and I will come back to this when we discuss lines of communication.

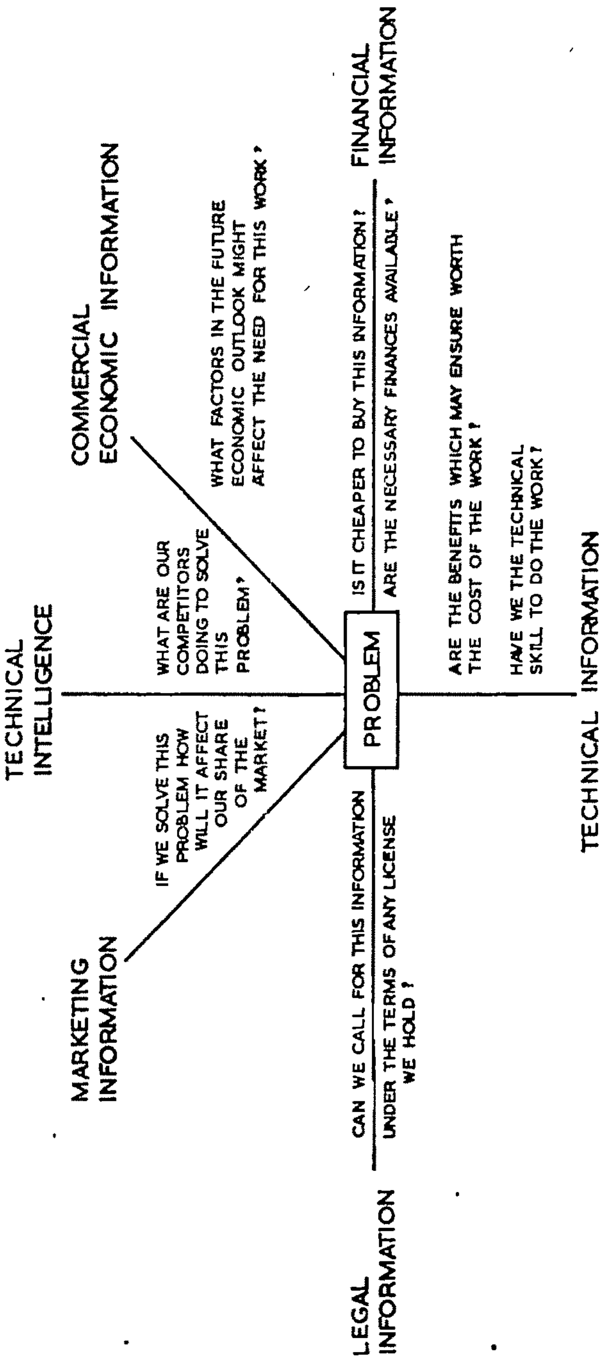

TECHNICAL INTELLIGENCE
COMMERCIAL ECONOMIC INFORMATION
FINANCIAL INFORMATION
MARKETING INFORMATION
LEGAL INFORMATION
TECHNICAL INFORMATION
PROBLEM
WHAT ARE OUR COMPETITORS DOING TO SOLVE THIS PROBLEM?
IF WE SOLVE THIS PROBLEM HOW WILL IT AFFECT OUR SHARE OF THE MARKET?
WHAT FACTORS IN THE FUTURE ECONOMIC OUTLOOK MIGHT AFFECT THE NEED FOR THIS WORK?
IS IT CHEAPER TO BUY THIS INFORMATION?
ARE THE NECESSARY FINANCES AVAILABLE?
CAN WE CALL FOR THIS INFORMATION UNDER THE TERMS OF ANY LICENSE WE HOLD?
ARE THE BENEFITS WHICH MAY ENSURE WORTH THE COST OF THE WORK?
HAVE WE THE TECHNICAL SKILL TO DO THE WORK?

FIG. 2: *Information for decision making*

An information unit should have an identity, that is to say a status at all levels in the company, but there are some areas where it is more important to have status than others.

What I am suggesting is that the information unit should not treat all enquiries necessarily as equal nor treat all enquirers as equal. I am suggesting that an information unit should have an eye to the market place and should grade enquiries with respect to the market value of the answer to the company. In many cases one finds that from this criteria the most important enquiries still come from certain departments and certain easily identifiable people in management. It is not that you try less hard but that you do not try as long. I believe the information unit will earn more lasting status if the harsh realities of the market place are viewed as one of the commandments which must be in the forefront of the mind as a code of conduct. An information unit should not spend its time darting here and there at the whims of every enquiry. It should spend a considerable time on those enquiries whose relation to the market place can be demonstrated and less time with those not so firmly footed. Here status can be related to efficient management and to effective utilization of skills and time.

Status can also be a function of the overall area of responsibility both in relation to the subjects covered and the parts of the organization served. If an information unit serves research and development only then it has less status than if it served the whole company and was so designated. It would have a better status if it had an appeal to all departments in the company, technical, production and marketing, rather than just one department.

Let me try to illustrate (Fig. 2) the interplay of various factors to show why I believe that a comprehensive information unit is the real aim if the information unit is to be really effective in a company and for it to have status.

If an information unit is presented with a technical enquiry then usually the answer will be in technical terms. But these terms will not necessarily indicate if the technical task which gave rise to the enquiry is worth undertaking at all. For instance are there any economic factors arising which would negate the utilization of the work, is there any government legislation which would affect its utilization? What are competitors doing in this area? How would the solution to the problem affect the company's share of the market?

You see we are back in the market place which is the right place for an information department to be.

The status of an information unit can be measured by the amount of interaction it develops: interaction between information and users with the emphasis being very much on the action. Has any information unit got a really effective feedback loop when it provides an enquirer with information. How does it know how much real use that information has been? Does it sit in blissful ignorance thinking we did a good job there?

If an information unit had a system where the enquirer said what use had been made of the information and if possible put a monetary cost on it (I know both these are hard to do but that should not stop an information unit trying to do them) then the unit would have a measure of its effectiveness and we would not hear the cry—'well an information unit is really an act of faith'.

A unit could cost its time on an enquiry and ask the enquirer if the information was worth the cost.

I do not wish to imply that the information department should be totally committed to cost benefit analysis, otherwise it could tend to restrict enquiries to those where benefits can be demonstrated in the short term only. It is necessary for the department to strike a balance and if I may express it this way to use part of the cost benefits of the short term to subsidize the long term.

I am sorry to have to say it again but I do think many information units run around being very busy but not really being gainfully employed.

Status is earned more than granted and is tied up with effective management of the work.

Lines of communication

Any information unit must have lines of communication, both formal and informal, with the organization it is trying to serve, otherwise how can it know the needs of that organization and how can it react to those needs. This is self evident. But what sort of lines of communication are they, how are they established, how are signals passed down them and how do we ensure they do not get blocked. Let me give you some examples of how this might be done. I must give some examples since I am sure that there are several effective ways depending on particular circumstances.

One of the most effective ways to establish communications is to second, or recruit, good people from within the organization to work in the information unit. These people bring with them their own contacts and their own lines of communication which can be added to the ones already existing in the unit. We used to think of the information unit being populated by people who hadn't made it elsewhere. If we are more positive and think about what use can be made of good people who have been elsewhere then we may get somewhere.

Who would be more effective in the short and long term—the person who has done a 2 to 3 year information course who then has to learn about the company and build his contacts or the person who has been in the company five or six years and though he brings his contacts with him has to be taught information work on the job or at short courses?

In every company there is a structure of committees dealing with technical, commercial and financial matters. The authority exercised by the committee can and does of course vary from company to company but it is important that the information unit has lines of communication with these committees because this is where decisions vital to the company are taken and decision makers need information. I am not necessarily saying that communications are necessary with all committees but that the information unit should review the committees and their work and decide which ones are the most important and which ones the unit could, should or must help. Obviously from our business point of view the engineering planning committee is more important than the canteen committee.

As a method of approach I would suggest developing links with the most important committee first. A good job done here and the status of the information unit is improved. As well as this such links provide vital information to the unit of the needs of the company. A careful approach is needed to each committee, and depending on the personalities more than one approach may be necessary. A bad approach which is turned down creates a situation which will be hard to retrieve. This approach will also depend on the responsibilities of a particular committee but I would suggest, as an opening approach to the committee, that the chairman should be spoken to along the lines that the committee could usefully discuss, and then act as necessary, a one page summary of recent internal and external developments in the committee's area of responsibility.

Lines of communication are only effective when they are used.

In themselves they are useless, a wasting asset. It is up to the information unit to use them and to make sure others do the same.

I will return to these links with committees later when I give a specific example of how some links have been built up.

Communications with individuals must exist or again how can the unit operate? Enquiries come in from individuals, answers go to individuals, selective dissemination is to individuals.

I have often heard it said that an information unit must know everyone in the organization, but is this so?

In most organizations it is just impossible because of the size. It is necessary to build lines of communication with certain individuals, as individuals or as groups if we are to demonstrate our credibility as managers and our credibility to management. But if you agree that we cannot know everyone should we not consciously make the effort to know someone in each department and to feed information into the department through this individual and understand the needs of the department via this individual? I would suggest that in this way lines of communication throughout the company can be developed.

It must be admitted that this prime individual must be located and chosen carefully if this method is to be effective. He must be in a position to know all the work and plans of the department and must be the type who is in friendly contact with most of his colleagues. Since like begets like once you have found one of these individuals he is likely to know someone in another department and this someone is likely to have the same sort of characteristics. So the links are formed on this informal, friendly, personal basis.

As well as this if a unit analyses from which part of an organization it is receiving enquiries this will show those parts not using the unit. We could say we are overworked anyway and we could not answer any more enquiries or we help those who want to be helped. Is this a good management attitude? Should we not help those who can best use the help, or need the help most, whose utilization would best help the company. Back in the market place again!

It is worth spending a considerable time trying to analyse the role of the individual in receiving and transmitting communications. Let us remember that communication implies receiving, understanding and reacting to information. Without the interaction of the individual our efforts in communication have been wasted.

The work of Allen and Whiteley and Frost, amongst others, on communications in industrial laboratories and the role of the individual and the 'gate keeper' concept is fairly well known. Their work has shown that in each laboratory there are individuals who are used as sources of information by their colleagues. These individuals seek and receive more information from internal and external sources and are able to interpret it and transmit it to their colleagues in useable form. I think we forget that in an industrial laboratory probably half the information we receive in the form of periodicals is either useless or unintelligible to the majority of people in the laboratory.

These studies have shown us the situation which exists. What I have not seen very much is an interpretation of those findings leading to suggestions of courses of action for an information unit in order to maximize its effectiveness. These seem to me to be very important findings that should influence the way in which an information unit works. Questions should be asked whether circulation or availability to all of periodicals is the best way of information transmission, whether the answering of enquiries from all means that the answers have a good, bad or mediocre chance of being effectively utilized.

An information unit should be concerned and involved with communications research. I do not believe that an information unit should spend a lot of its time building up its sources of information without spending a similar amount of time investigating ways of making sure that the information it receives is utilized.

People are the key to all this and I will give you an example of how my company has tried to increase the effectiveness of its lines of communication. Let me warn again this is a solution to a particular situation. I suggest it is worth analysis—not necessarily any more than that.

The problem was to devise an effective method of evaluating and spreading information throughout a company having works on various sites but each works having a considerable portion of common technology. Associated with this method should be an equally effective method of answering enquiries.

The solution to the problem was devised taking three, to us, major factors into account.

1. The majority of people do not read much literature, if any at all.
2. The research done by Allen.
3. The company has main technical areas each of which is represented by a working party which directs the technical effort in that area.

This led us to devise a system based not on literature but on people. We postulated that if we could find people who had technical authority in our main areas, were 'visible' in the company and were of a friendly disposition then we should build our system around these men. We should let them interpret new information and transmit it and also use their experience to answer enquiries. One of our key phrases was and is 'Information carries responsibility'.

We located one man in each working party who answered our three criteria. They had technical authority or they would not be on the working party, they were 'visible' in that as part of their working party and line management function they were required to pay frequent visits to most works and they, at least in our estimation, had an outgoing disposition. Allen talks about the natural growth of gatekeepers. We had not the time to study if our choices were natural gatekeepers—we had to make them gatekeepers natural or not.

It was pleasing to see the finding of Whiteley and Frost in 1972, after our system had been operating for two years, that effective gatekeepers had to be visible and in particular it was important that the scientist be seen to be expert and knowledgeable by his colleagues as well as by management. The method of operation of the system is as shown in Figure 3.

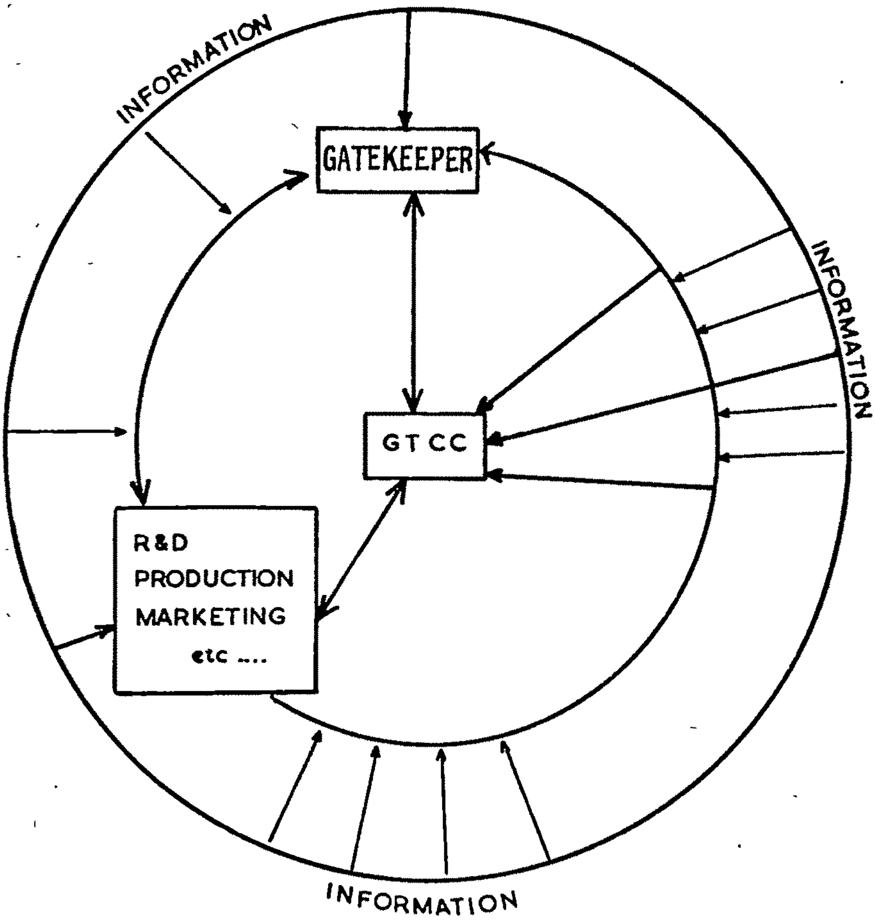


FIG. 3: *Operation of communications system*

Information comes into the system, the point of entry does not really matter, the system being a loop and is assessed by the gatekeeper, interpreted and a decision taken as to what action is required. This action could be to start a particular piece of work or to stop one, and to communicate the information to others. 'Information is for decision making.'

The gatekeeper also receives enquiries which he answers from his own experience and those of his colleagues, maybe consulting literature to confirm a point or to add to his experience.

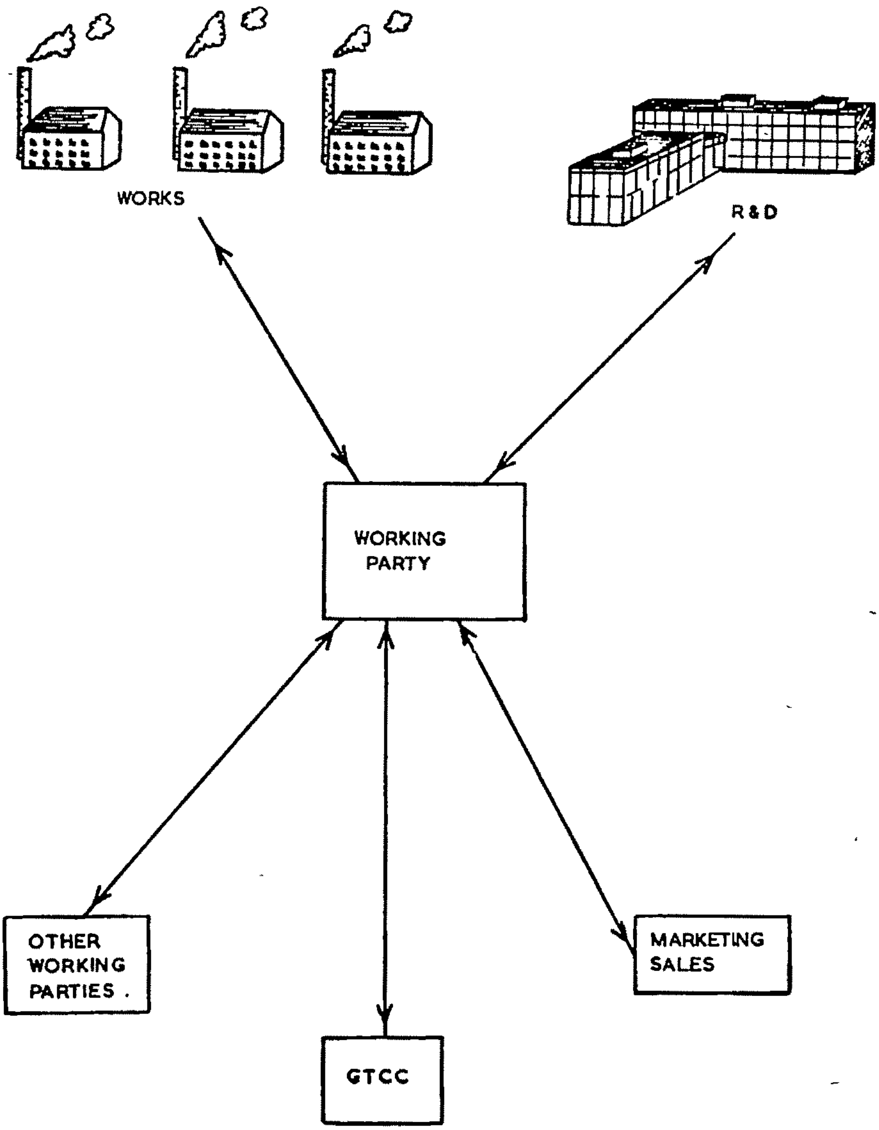


FIG. 4: *Working party communications*

What then is the role of the information unit? Certainly not the traditional role. It works intimately with a few dozen people and much less intimately with others. It acts as a back up for the gatekeepers by indexing information and acting as an aid to their memory.

Could information workers act as gatekeepers? They certainly should be 'visible' and be of a friendly disposition but I think that very few could claim to be seen to be scientifically expert and knowledgeable by the scientists and technologists and by management, that is to the level required of gatekeepers. Also are they sufficiently competent and in a position to issue recommendations for action?

From these initial steps we have gone on to review the communications to and from a working party, where these originate and to where they should flow (Figure 4).

The system is based on the need to ensure that information is utilized and indeed we have a known company policy which emphasizes the importance of communications.

Does the system work? Let me be a little imprecise and say as far as we know, yes. We have no elaborate system for measuring the effectiveness, we have never sent out a questionnaire asking whether people find difficulty in obtaining information. Our monitoring is done on a personal informal basis. Each member of the information unit is responsible for knowing the processes and people in certain works and certain parts of R. & D. and he pays regular visits to these areas to update his knowledge. During the course of these visits questions are asked about the availability of information. What we are sure of is that the gatekeepers are receiving information and that decisions and actions are resulting from this information.

Before moving on to the relationship with management I should emphasize the important lines of communication with planning departments, both technical and commercial. If there is no contact with these departments then the information unit is always in a position of running with the hounds behind the hare. It cannot be totally effective unless if forms a part of the planning operation, it will always be waiting for requests for information, never anticipating them.

Let me give an example of links with a technical planning unit. When anyone proposes that technical or scientific work should be done then in many companies the planning unit becomes involved so that the ideas are properly vetted, and the right amount of money, staff and space is allocated to the work.

If the information unit can be involved at this stage it is in a position to help direct the initial course of the work. By checking if the work has been done previously, both internally and externally to the company. It can advise the proposer of company staff with relevant experience, of external people with relevant experience, and of useful reports, patents and other literature. It is important to note that here we are working with our gatekeepers.

As the project proceeds the planning department will require signals as to the progress of the work and the information unit can again interact with the work as a result of these signals. A guide to communications during a project has been written in Pilkington and issued to the scientists (Figure 5).

I should also mention the need for good lines of communication with the patents department.

Relationship with management

Of course the information unit should have a good relationship with management. I do not just mean the immediate line management but management at all, or most, levels in the company. I have touched on this topic when talking about

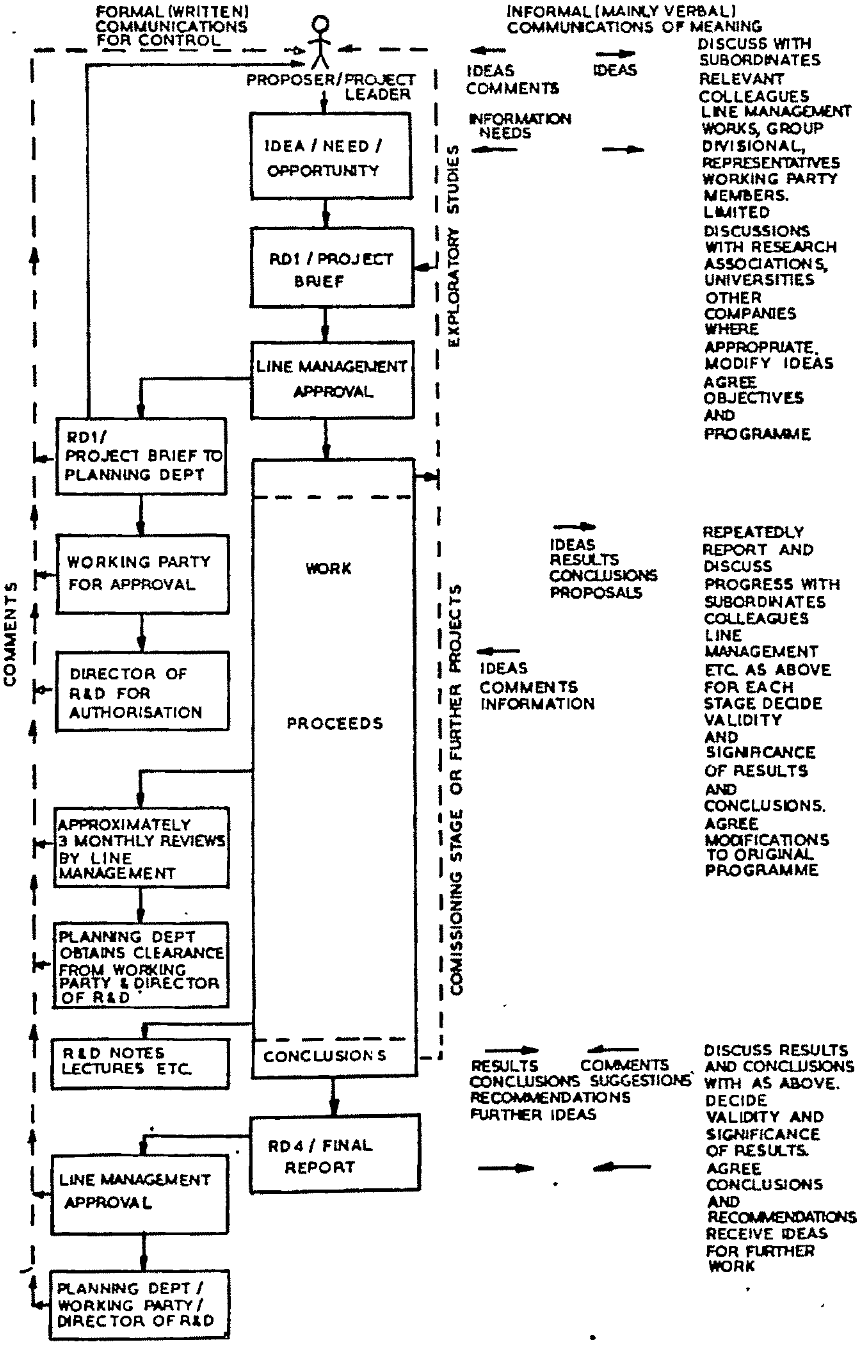

FORMAL (WRITTEN) COMMUNICATIONS FOR CONTROL
INFORMAL (MAINLY VERBAL) COMMUNICATIONS OF MEANING
PROPOSER/PROJECT LEADER
IDEAS COMMENTS
IDEAS
INFORMATION NEEDS
DISCUSS WITH SUBORDINATES RELEVANT COLLEAGUES LINE MANAGEMENT WORKS, GROUP DIVISIONAL, REPRESENTATIVES WORKING PARTY MEMBERS. LIMITED DISCUSSIONS WITH RESEARCH ASSOCIATIONS, UNIVERSITIES OTHER COMPANIES WHERE APPROPRIATE. MODIFY IDEAS AGREE OBJECTIVES AND PROGRAMME
IDEA / NEED / OPPORTUNITY
RD1 / PROJECT BRIEF
EXPLORATORY STUDIES
LINE MANAGEMENT APPROVAL
RD1/ PROJECT BRIEF TO PLANNING DEPT
WORKING PARTY FOR APPROVAL
DIRECTOR OF R&D FOR AUTHORISATION
COMMENTS
WORK
PROCEEDS
IDEAS RESULTS CONCLUSIONS PROPOSALS
IDEAS COMMENTS INFORMATION
REPEATEDLY REPORT AND DISCUSS PROGRESS WITH SUBORDINATES COLLEAGUES LINE MANAGEMENT ETC. AS ABOVE FOR EACH STAGE DECIDE VALIDITY AND SIGNIFICANCE OF RESULTS AND CONCLUSIONS. AGREE MODIFICATIONS TO ORIGINAL PROGRAMME
COMISSIONING STAGE OR FURTHER PROJECTS
APPROXIMATELY 3 MONTHLY REVIEWS BY LINE MANAGEMENT
PLANNING DEPT OBTAINS CLEARANCE FROM WORKING PARTY & DIRECTOR OF R&D
R&D NOTES LECTURES ETC.
CONCLUSIONS
RESULTS CONCLUSIONS RECOMMENDATIONS FURTHER IDEAS
COMMENTS SUGGESTIONS
DISCUSS RESULTS AND CONCLUSIONS WITH AS ABOVE. DECIDE VALIDITY AND SIGNIFICANCE OF RESULTS. AGREE CONCLUSIONS AND RECOMMENDATIONS RECEIVE IDEAS FOR FURTHER WORK
RD4 / FINAL REPORT
LINE MANAGEMENT APPROVAL
PLANNING DEPT / WORKING PARTY / DIRECTOR OF R&D

FIG. 5

status, for good relationships of this sort lead to a good status in the company.

These good relationships can be brought about by the speedy, efficient and effective answering of enquiries from management. This presupposes that management are putting such enquiries to the unit. Unless they know what the unit can do to help them then one cannot expect them to put such enquiries. So the building of good relations with management must be part of a continuing promotional process and this process must involve discussion with the manager of his information needs. A manager certainly needs information on which to base decisions. The more senior the manager the more he is likely to require digested information so that the salient facts on which to base a decision are highlighted whilst the tests and arguments leading to these facts are something that it is not always necessary for him to know.

It is, of course, as I have previously said, easy to appreciate that the better your relationships with management, the easier it is to justify your existence. I cannot really say—to measure your worth—for as has been mentioned previously, both here and elsewhere, this seems to be something which is very hard for an information unit to do. The best relationships are always built on mutual trust—this is something that the unit should be aiming to deserve.

Is it necessary for the information unit to present an annual report of its activities? I am a firm believer in the information unit publicizing its activities. What is the unit to do then?

First it has to consider to whom it is addressing itself. The necessary approach may be different depending on the person, or group of people to whom the report is presented. I would suggest that a technical information unit should aim its report at the senior technical person or committee amongst the areas it serves. Similarly a commercial information unit should aim its report at the senior commercial person or committee amongst the areas it serves. It is a measure of the status of the unit if this committee will discuss the report with the information manager present.

The report should not dwell on

(a) the number of enquiries dealt with
(b) the number of books or periodicals bought.

It should be concerned with

(a) the number of enquiries not dealt with satisfactorily and the reasons for this (lack of external contacts, lack of appropriate source material, etc.)
(b) the formation of external links to help answer enquiries
(c) the way in which the information unit is trying to relate itself to the work being undertaken by its enquirers. The steps being undertaken to obtain feedback from the enquirer
(d) those areas of the company not using the information service and the reasons why or the action being taken to rectify this
(e) the information units view of an effectiveness of internal technical or commercial communications. Any problems the unit faces in obtaining this internal information and the action it is taking to overcome these problems.

I am not suggesting that the report to the committee should be one long plea for help. Help may be asked for, but only when it can be clearly demonstrated that the unit has tried, and tried very hard to help itself.

Conclusions

I have talked about where I see the place of the information service and I hope presented some means of achieving that place. The overall aim should be that of interaction. Interaction between information and user to produce a decision. An information unit will never have any real place unless it can satisfy the real needs of the company and the needs of the individuals in the company. This means that there must be some searching analysis by the unit to decide what it should do and in what manner and the potential user must be brought into the deliberations before a final decision is taken.

An information unit is like a supply line, feeding ammunition to the troops at the front. In total it has more ammunition than each individual, it must see that each individual gets what he needs. But do not forget that ammunition only realizes its maximum potential when it is fired.

Information units over the years seem to have gone from being passive to being disseminators. If we take the next step to being activators, evaluators and decision prompters then we really will have and will deserve a leading place in the organization.

Acknowledgement. The author wishes to thank the Directors of Pilkington Brothers Ltd and Dr D. S. Oliver, Director of Group Research and Development for permission to publish this paper.

DISCUSSION

MRS M. E. BEASLEY (University College, Cardiff), observed that at all conferences the problem of evaluation of information by information staff was raised, and one of the differences between the two speakers was on deciding how and if the information worker could evaluate information. In her experience, in situations where large amounts of material were entering the system, accept-reject decisions were forced on the information staff.

DR N. E. BATTEN (Consultant), added that he sometimes thought one of the most valuable functions of an information worker was to give the user what he did not want, as a corrective to wrong decision based on partial evidence.

MR P. O'N. HOEY (J. Lyons & Co.), said that Mr Rowe had presented the old-style view of librarians, and Mr. Yates the more modern view of the information worker. This highlighted the poor image of library/information workers in areas outside science and technology, indicating the necessity of improving the image of the profession in areas such as marketing economics and management.

MR R. G. GROEGER (John Laing Ltd.), said that, following Mr Yates' remarks on visibility in the market place, it must be realized that the market place was a very sophisticated place. He suggested creating a 'brand image' for the information service in his own organization, the information service logo was on everything sent out. Both speakers had discussed the status of the information service; as it was frequently suggested that scientists wanted to be given information service by scientists, it might by analogy be desirable to add marketing or accounting men to the information department to facilitate communication.

MR ROWE, replying, said that a great deal of fact-collection went on in his organization, and it was necessary to decide the role of the information unit in the total process. It was difficult to accept that placing all fact-collection under one unit could result in greater efficiency, because, for example, if a marketing decision had to be made, the natural source of information would be the market research workers. It might, however be possible to envisage an overall unit embracing information, market research and other like activities.

MR P. CEMACH (Anbar Publications Ltd.), expressed his pleasure with Mr Rowe's reply. It would be very dangerous to assume that every accountant would select the right information on accounting, and similarly for other subjects. This experience in selecting the abstractors suggested that only a few people had the ability to spot the truly significant developments, yet this was what mattered most.

MRS L. M. SKEHAM (P. A. Management Consultants Pty. Ltd., Australia), said that in Australia most businesses were too small to have their own marketing division, and used consultants instead. Information services worked for consultants, and wrote up the reports which were passed back to the companies.

MISS A. R. HAYGARTH JACKSON (ICI Pharmaceuticals), referring to Mr Yates' comment that 'gatekeepers' or contacts identified in work-groups were preferentially fed by information services, wondered whether this situation was acceptable to other members of work-groups, who presumably received much less service. Also, did not staff mobility present problems when the well-served contacts moved, in that a 'starvation situation' occurred?

MR YATES denied that a starvation situation occurred, it was true that contacts tended to move, this being one of their natural characteristics, but a continuous training programme took care of this. Gatekeepers did not deprive others of service, the library and information services were still available to others, though the first priority was to find gatekeepers.

Management techniques applied to the operation of information services

D. Mason

College of Librarianship Wales

Paper presented at the Aslib 47th Annual Conference, University of Bath, 23–26th September 1973

CONFUCIUS, that ancient Chinese sage who has been held responsible for so many pseudo-philosophical statements, was asked by one of his disciples what was the first thing he would do if he were appointed head of government. 'I would rectify the use of terms' replied Confucius. The disciple then enquired what such an action had to do with government, and received the answer 'If words are not used correctly then speech becomes tied in knots, and business comes to a standstill.' Confucius may have been stating the extreme case but nevertheless it is perhaps as well to define terms, so let us begin with the verb 'to manage'. The Oxford English Dictionary states that it derives from the Latin *manus* (a hand) and it can mean 'to train a horse in its paces; to make an object serve one's purpose; to control the course of affairs by one's own actions; to administer; to husband; to treat a person with indulgence; to cause persons to submit to one's control; to bring about one's wishes by artifice and flattery; and to contrive to get along or pull through'.

A manager is defined as one skilled in managing affairs, money etc., and one who manages a business or institution. While management is the action or manner of managing; the use of contrivance for effecting some purpose; and, rather interestingly in view of certain styles of management, the manuring of land.

Most of these meanings have some relevance, but for most purposes today I prefer to define management as the art, or science, of controlling enterprises and organizations through people. So when we come to examine techniques of management we are concerned with the relationships between the manager and other persons, some of whom are in some way subject to his control, some are his bosses, while others who are not directly involved can nevertheless influence his actions, or be influenced in their actions by him.

We can represent a company as a triangle of forces with a group of people at each of the points. There are the shareholders who provide the capital to operate the company, the staff who provide the know-how, and the customers who purchase the products. And I refer to it as a triangle of forces because it is necessary to keep the system in balance. Undue preference for any one or two groups and consequent down-grading of the remainder will bring about a state of imbalance that can lead a company into difficulties.

A service department can also be represented in the same way. Here the three groups consist of the top management who allocate the resources, the staff who convert those resources into services, and the customers who use the services (some of whom will also, of course, be top management). Again it is necessary to keep the forces, or demands, in balance. Sufficient resources must be obtained to provide adequate services for customers and job satisfaction for staff; and sufficient information must be made available to demonstrate to top management that the resources are being used effectively. Thus management becomes, in effect, a continuing compromise between what is desirable in terms of service and satisfaction, and one or more of a range of feasibilities which depend on the availability of resources.

In addition it is essential to be aware of the objectives of the enterprise, to known why something is being done as well as how it is being done. In a service context this means that the job objectives of individual members of staff must be compatible with the departmental objectives, and these in turn must match the company's objectives. All activities need to be examined in this light, bearing particularly in mind the old saying 'Never to a thing well if it needn't be done at all.'

The usefulness, or otherwise, of any management technique has to be judged within this framework. A company usually has an overall style of management which has to be modified to fit the service environment. It also usually has at any one time some particular management fad to which all managers are expected to pay at least lip-service. However, it does not require many years of experience to teach the Information Manager to recognize and use those fads which can help him in his job; and to circumvent, while apparently using, those that do not.

The range of management techniques available for use is wide, and the Manager must make his own selection to match his own needs. Some techniques are useful because they provide the Manager with information which enables him to plan and control his systems, services and staff; and also to provide information to higher management in order to influence the allocation of resources. Other techniques can be used, as required, to provide optimized solutions to particular problems. In examining a selection of these techniques I intend to categorize them into those relating to, first, systems, then services, then staff, and last, but not least, finance.

Systems analysis

The totality of activities within an Information Unit forms a system which exists to provide information, and access to information, to a group of users. The technique of systems analysis can be used to study this system and its subsystems in order to demonstrate the inter-relationships of the component parts, their effectiveness or otherwise, and whether there is a need for any modification or replacement. It is also of use in design and implementation of new systems. Because of the complexity of information systems, and because information staff usually cannot down tools in order to carry out a full analysis, most systems investigations have been made into particular activities and technical processes. Some studies have been made of the relationship between two or three subsystems, but there is a lot of work still to be done in this field.

A systems analysis must always start from the objectives of the system, and then look at the functions of the system and how these are carried out.[1] The relationship of the system to other systems must be determined so that any necessary constraints are observed. A useful approach is the 'critical examination' of each activity within the system. This is nothing new, it forms a part of what used to be called 'method study', but nevertheless it is effective. Each activity is defined, then examined by asking the following questions:

1. Why is this done, need it be continued, can the need for it be avoided?
2. How is it done, why this way, can a better way be found?
3. When is it done, why then, can a better time be found?
4. Where is it done, why there, can a better place be found?
5. Who does it, why is it done by him/them, would another person/group be better?

At the same time performance data can be collected, e.g. time spent on each operation, volume of work, rates of pay, etc.

In the next stage the system is analysed. This can be done by drawing up such things as organization diagrams and flow charts. Process flow charts can demonstrate the physical movement of materials, and logical flow charts can show where decisions are made, and their effect on the subsequent parts of the process.[2] From the times of the activities staff costs are determined, material and other costs are added to obtain a total cost. Costs of any alternative methods can also be estimated for comparison.

If and when decisions are made to modify the system, or introduce a new system, the stage of system design is carried out, although the major part of the thinking out of the design will usually have been done during the analysis stage. Finally, there is the implementation and evaluation of the new or modified system. This needs to be controlled carefully because, however good the design is, there will always be unexpected factors arising, usually at the interface between the new system and other existing systems.

In designing new or modified systems one must be aware that the system is not intended to operate in a vacuum. It will have effects on the people who operate it, and the people who derive service from it. Therefore in looking at a particular system, one not only examines the *technical* needs, possibilities and constraints to draw up a list of possible improved methods: but also one identifies the *social* needs, possibilities and constraints, listing alternative systems and eliminating those which do not improve on or maintain the present position. The two lists of alternatives can then be compared, and the elimination of incompatible solutions will lead to a list of those that are acceptable on both technical and sociological grounds.[3]

Operations research

It has been pointed out that libraries and information services do not lend themselves easily to experimentation. Yet there are many occasions when it would be useful to compare different methods in order to get some idea of which is the most effective. Operations research techniques are useful for such an investigation, particularly in the development of mathematical models of systems, and in computer simulation.

Leimkuhler, in reporting work carried out at Purdue University Library, says 'A higher level of elegance and sophistication can be reached with mathematical models at the cost of greater precision in the statement of assumptions and some loss in the ease of enumeration. As with literary language, mathematics can be made to convey an enormous amount of meaning in a very concise way to those who are prepared to understand the fullness of the language. On the other hand, admittedly, it can be a prohibitive barrier to the layman; it can be used to disguise the true facts in a study, and can lead to sterile working of old ideas. But when properly used, quantitative models can provide the most general insights into the behaviour of a system, allowing for experimental validation and meaningful comparison with other systems.'[4]

The important point to note is that mathematical models are not intended to be other than guides to decision making. Because they present a simplified version of a *real* system, they enable managers to understand the nature of the system; and in using this understanding, together with other factors of which they are aware, they should arrive at better management decisions.

The use of operations research techniques within a library environment is well demonstrated by the work of the University of Lancaster Library Research Unit.[5] Analyses have been made of technical processes and library usage. Their study of a variable loan and duplication policy included the comparison of the loan period and the number of copies of a book, with the popularity rating of the book, and the satisfaction level of the user. The proportion of books at various levels of demand was estimated from loan records, and the effect on the satisfaction level was computed for any given combination of length of loan, amount of in-library use, number of copies, and the probability that a user would ask for a book to be reserved or recalled if he could not find it on the shelves. The borrowing process was then simulated on the computer so that the effect of different policies could be ascertained. Other calculations were made in order to assess the costs of the various policies. As a result of this work a variable loan policy was introduced which led to a sudden increase in library use. The increase in borrowing from the shelves was 200 per cent over two years. An increase of this size had not been expected so this led to further work on the development of models of user behaviour.[6]

Another interesting outcome of the work at Lancaster has been the Library Management Game, which uses a computerized simulation technique to predict the likely consequences of any set of decisions that the participants make.[7] The game has been developed for use in library management education. The student is faced with a problem involving allocation of resources in a certain year and has to make a series of decisions. These are input to the computer using a remote access terminal, and the effects of his decisions are almost immediately printed out. Decisions can then be made for the next year and the cycle repeated. This enables the student to see within a very short time the likely outcome over a period of years of his particular policies. The importance of this game in library education lies particularly in the way it helps to develop the understanding of the decision-making process, and also to give an appreciation of the multitude of variable factors involved.

Market research

In any decision to make changes to systems and services, one of the major factors to be considered is the likely effect of the changes on the people who operate the systems or use the services. Management decisions that are based on hunches about what will give satisfaction to service users can turn out to be very expensive if the hunches are wrong. To ensure that the changes are both effective and acceptable, information on users needs and attitudes is needed; and this information is usually obtained by means of a survey.

A survey can take many forms, from a circulated questionnaire to the collection of data from the Information Unit's own records. Most Information Managers, however, do not usually have the time to design and implement a survey that will produce a good level of information, and in any case they might not get the willing co-operation of their customers in such matters as the completion of questionnaires. I can recall an Organization and Method survey, made many years ago, into the content of the research worker's day. It was organized on a random observation basis, and the method used required each worker to put a tick on a form against the category of activity in which he was occupied on each occasion that a bell was rung. An O & M man, hidden somewhere in the middle of his web, rang the bell at times which were derived from random number tables. A good statistical approach, as I am sure you would agree. There was, however, a major snag. The research workers soon got fed up with being summoned by bells, and there was a conspiracy, the results of which demonstrated to the astonished O & M investigator that scientists spent 80% of their time in the loo.

There is no doubt that a properly designed survey can yield valuable results, but with the limited resources he has at his command, the Information Manager can rarely afford such a survey. However if he is a good Manager (and I am sure that you all come into this category) he and his staff will have such a wide range of contacts with their customers that they will be able to ask on a personal basis for guidance in the improvement of the services; and if the services are badly in need of improvement they won't have to ask, they will be told in no uncertain terms.

However it is always as well to check opinions against facts. It has, for instance, been found that scientists' *recollections* of what they have done, correlate poorly with *facts* obtained by observation. In at least one survey, many of the scientists spoke of the importance of abstracts, the use they made of them, and the need for better coverage of the literature; whereas observations of their activities showed that they made very little use at all of abstracting journals.

If the information required can be obtained by observation or by analysis of records it will usually be more accurate than opinon sampling. Some years ago I was faced with the problem of deciding whether or not to purchase Chemical Abstracts in microform. There was pressure on me to make this purchase because of the resultant saving in space, and also because of the other advantages that were being extolled for microform at that time. Although I have always been a believer in these advantages I was not convinced that there would be any in this case. To make a correct decision I needed information on the use made of Chemical Abstracts in our library, but I felt that it would not be useful to ask the research workers for their 'best guesses'. So we decided to obtain the details by observation, using a member of staff who was working in the abstracts area and was therefore ignored by the customers. Each period of observation was half-an-hour, the days were selected randomly and the observations were continued until we had a reasonably accurate picture of an average day's usage. The results demonstrated that to match the usage of one bound set of Chemical Abstracts we would need two microfilm sets and twelve microfilm readers. We concluded therefore that we were better off as we were, even though we were losing the advantage of easy production of hard copy.

Although one can obtain factual information in this way, obviously it is the interpretation of these facts that is important in the making of management decisions. For example a study of the use of periodical literature within a particular information and library service may well be biased because of the availability to the users of the titles actually held. In such a case it is best to check the findings against those in one of the more general surveys that have been made, in the same subject area if one exists for that subject.[8]

In evaluating both systems and services, we need to have various measures of effectiveness. Over the last few years work has been carried out in the field of what is now known as 'bibliometrics', and for library operations several measures are becoming reasonably well established. However, there is a need for more research to be done on measures of effectiveness in the supply and use of information. Perhaps before long we shall have a science of 'infometrics', and be able to calculate the value of the information which we supply.

Network analysis

In examining and evaluating systems and services, and particularly in planning the implementation of new services, there is a group of techniques available to guide the manager in his decision making. The general term to describe them is 'network analysis', and the individual techniques include PERT (Program evaluation and review), PEP (Program evaluation procedure), SCANS (Scheduling and control by automated network), and CPM (Critical path method). Some of these methods are used to analyse very large networks. For example, it has been estimated that the completion time of the Polaris missile system was reduced from 7 years to 5 years by this type of planning. For our purposes the critical path method, which is not difficult to apply, can prove a useful technique.

A project consists of a series of activities which are interrelated, and these can be represented diagramatically as a network. The critical path through this network is the one which links those activities which are critical in the sense that if any one of them is not completed on time, then the completion of the whole project will be delayed. The elementary form of critical path analysis is concerned only with the time of the activities. A more advanced form also takes into consideration the relationship between time and costs. The technique can be used to plan and control a project, and is also useful when a deadline has to be met, because it will show those activities which will require increased manpower in order to be completed within the required time. I have used CPM to plan the implementation of large computerized information storage and retrieval systems, and more recently to analyse the interrelationships of the activities involved in the final examination of students.

Personnel management

Let us turn now to techniques used in the management of personnel. As I indicated in my introductory remarks, because we operate our services through people and for people, this is the most important area of management with which we are involved. The 'motivation' of staff has been investigated fairly thoroughly and it is generally accepted that the factors involved in motivation fall into two groups. There are the 'dissatisfiers' which deal with conditions relating to the work situation, such as pay, working conditions, company organization and policy. These can and do lead to various levels of dissatisfaction, but rarely lead to positive feelings about the job. On the other hand, the 'satisfiers' which are characteristics associated with a specific task, such as achievement, recognition, advancement, value of the work, produce favourable reactions to the job. The Information Manager can often only indirectly influence the negative dissatisfying factors, but he can directly control the positive satisfying factors; and if he wants to have a staff who are competent, capable and happy in their work then he must see that the 'satisfiers' are all present and correct.[9]

One of the techniques which appears to offer this state of affairs is management by objectives, usually referred to as MBO. Now I have heard a certain amount of cynical comment on MBO, some managers have said they prefer MBM—management by management, and others that they go for MBBO—management by being objectionable. However I think we should look at what MBO has to offer and see whether any of it is of value in a service environment.

MBO has been defined as a dynamic system which seeks to integrate the company's need to achieve its goals of profit and growth, with the manager's need to contribute and develop himself.[10] If the technique is to be successful there has to be whole-hearted company commitment.

The first stage consists of strategic planning. The company's performance, strengths and limitations have to be assessed, together with the external environment and the expectations of the shareholders. This assessment leads to the clarification of company objectives, and to the evaluation of alternative courses of action. The next stage is tactical planning. This covers a whole range of activities including the planning of the organization itself, planning for product and market development, resource development, and actual operations. From this stage the detailed plans emerge and unit objectives can be agreed with individual managers.

The manager himself is informed of the main purpose of his job, his position in the organization and the limits of his authority. He is also concerned with the preparation of an analysis of key tasks within his unit. This analysis shows for each key task the performance standard by which the progress of the work is to be measured. This can be qualitative, in the sense of a judgement on how well it is done; but is usually quantitative in the sense of how much work is done, can it be completed more quickly?, can the costs be reduced? The analysis also gives the control data by which the performance standards can be metered, and any suggestions for improvement. Plans can then be drawn up for the improvement of these jobs and obviously must be agreed with the people who are doing them. In fact the best results can come from this if staff are given a fairly free hand to devise their own improved standards, although, like Father O'Flynn, the manager must always be

'Checking de crazy ones
Coaxing unaisy ones
Lifting de lazy ones
On wid de stick'.

Each member of staff, and this includes the manager, has certain needs in order to do a better job. The first is agreement on what is expected from him. This is met by clarifying unit and personal objectives, and by drawing up job improvement plans. The second need is to be given to opportunity to carry out his work effectively and this is met by proper organizational planning so that each person knows the range of his activities and authority, and that there is no overlap or underlap. The third need is to be informed of how he is getting on. This is done by agreeing with him performance standards and time schedule, and by a regular series of performance review meetings. The fourth need is for guidance in achieving improvement and this is met by training.

Training is of vital importance in staff development. It is no use the manager looking for improved standards if the staff are, through lack of knowledge, not capable of reaching these levels. For each member of staff it is necessary to compare the required performance with present abilities, identify the training needs, and then ensure that training is given. It may be on-the-job training that is needed, or perhaps one or more short courses will provide the necessary knowledge. One must also look beyond the present job and identify training needs for the future, both for the person whose job is changing because of different requirements or new systems, and for the person who is being considered for promotion to a higher level job.

The main points that emerge from an examination of MBO are the formulation of objectives, the involvement of staff at all levels in the effective furtherance of those objectives, and the continuous need for staff training. Now most information units are small. The 2–3 man band is fairly common; and, probably because most of us operate in these small groups, we have long been aware of the fact that good service is given by efficient team work. All our staff tend to be deeply involved in the operation of the information unit, simply because we cannot carry passengers and so we learn to either recognize them before we appoint them, or, if we have made a mistake in the appointment, to move that mistake smartly on to somewhere else. When it comes to objectives, we have perhaps been a bit slow in putting them down on paper, but the sense of purpose and dedication that is found in most information units shows that staff are fully aware of what the unit is trying to do. John Humble, the leading authority on MBO, has said 'The best managers have always practised Management by Objectives', and I think we can go along with that statement.

However, the sort of thing that can happen which leads to cynicism about MBO, is the introduction of the system by a company and the insistence of higher management that all increased performance shall be measured quantitatively. In most service environments this leads to difficulty, but for suppliers of information it is a real problem. What is the value of the information we gave to Dr Bloggs? He doesn't really know and neither do we. How can we increase this value? If we usually put about 200 abstracts in our weekly bulletin, will stepping it up to 300 be an increase in performance? Well it may be in one sense but it is likely to be counter-productive in that the smaller bulletin may have been scanned regularly whereas the larger will be put on one side to be read later—which means never.

The important factor in an information service is its quality and this can only be assessed by judgement; and the Information Manager has to have the confidence and ability to make these judgements and be able to justify them. If we must show performance improvements then let us demonstrate our effectiveness by having a rapid response time to requests for service, and by supplying only the information required, not too little and not too much.

I have heard of a certain company that introduced a partial MBO scheme in which all members of staff were to hold meetings in their units and departments to prepare task analyses and work improvement targets. They were also to discuss with members of other departments the effect of any proposed changes on those departments. The carrot was a rise all round for each department as soon as it had produced, and had accepted by higher management, its improvement plan, together with a quantification of the money saved annually by the plan; this latter being the stick that went with the carrot.

The first effect of this scheme was that most communication within the company ceased overnight. Nobody could contact anybody else because everybody was in a meeting. What this cost the company I shudder to think, but I am certain that it would have had to save a lot of money through the improvement plans before it even began to balance the cost. The second effect was that, particularly in service departments, there was an insistence on reduction of overheads which could often only be achieved by cutting down on staff, which in turn led to failure of services. Often the enforced cancellation of a service led to the work being done at a greater cost within those departments who had previously received, what was to them, an essential service. It is not surprising that one of the end products of this exercise was an increase in staff union activity. The moral of this cautionary tale is that if the MBO system has to be implemented, it must be remembered that an essential part of the scheme, when properly applied, is that benefits accrue to the staff as well as to the company. And this is only right and proper, for what is one without the other.

Job evaluation and staff assessment

In implementing a personnel policy, the manager has constantly to be aware of the value of the individual jobs in his department, and the worth of the person in each job. The former is dealt with by the technique of job evaluation and the latter by staff assessment. Although distinct, the two are obviously interrelated because the remuneration of staff, even when dependent on ability will still lie within a particular scale based on the estimated value of the work done.

There are many different methods for assessing job values but most of them concentrate on the characteristics of the work being done and the mental and physical attributes needed to do the job to an acceptable level. A typical scheme might award points on a scale for the degree of responsibility required in, for example, such matters as number of staff controlled, number of communications (i.e. the disruption factor) and level of decision making. The total of the points awarded to the various factors determines the pay scale. Information Managers obviously have to operate the particular scheme used in their company, and do so with fairness. It is often difficult to slot information activities into schemes designed for less specialized activities, and information staff can suffer because of this. The remedy is to obtain special interpretations of the information jobs in relation to the scheme; and also for the manager to be constantly aware of the salaries for similar jobs being offered on the open market. It is true that many job advertisements do not specify salaries, but if an information manager needs comparative figures he can ask Aslib for help. Also the Library Association, who keep a close watch on salaries in special libraries and information units, can often provide the information needed.

Staff assessment fills two roles. It is used to decide such matters as the annual increment (or annual insult if you prefer to look at it that way); and also the personal maximum within a job grade. Assessment is usually against certain performance criteria (here, of course, there is a link with MBO) and certain personal factors. I am sure that many of us have met the problem of making an assessment of a person who is capable and efficient in performance, but personally gets up the backs of both information staff and customers.

The assessment is usually made by the person's immediate supervisor, and should be followed by an interview (which can be with the supervisor concerned or with the supervisor's boss) at which the assessment is discussed, and the person involved can agree or disagree, giving reasons for the latter. His views are then recorded on the assessment form and signed by both people present as an agreed accurate record.

I have tried various ways of making assessments but this way was the only one that worked. On one occasion I suggested to the staff that, using a standard form, they should assess themselves. This turned out to be just one more time when democracy did not appeal. I was told in no uncertain terms that I was the one who was paid to manage the department, that they were not going to do my work for me, and that I could get on and do the assessment myself, otherwise I knew what I could do with it.

Finance

It was St Paul who said that the love of money is the root of all evils. This may be true but does not prevent us having to face up to the problems of financial management, which in our terms means obtaining adequate resources to operate our services, and using those resources effectively and efficiently. Within any organization there is only a certain amount of money available for internal services, and it is the information manager's job to see that he gets a fair share of the cake. If he can get better than a fair share then more power to his elbow but he had better keep a sharp look out for Nemesis.

How do we go about getting our fair share? The traditional approach requires an annual estimate for expenditure under the usual headings of staff, stock, stationery, etc., and this is usually done by taking last year's figures and adding certain percentages for inflation, plus additional amounts for planned new activities. The estimates, or more usually the modified and reduced estimates are accepted and become the annual expenditure budget; and, if your accounting department is good, every month you will be told what you have spent under each heading. But none of this really helps you answer the top-managerial question which is usually framed in the form 'Good heavens—80% of your budget on staff—you'd better justify that—or else!'

The Planning-Programming-Budgeting System, PPBS for short, is a useful technique for showing the cost of each of your activities.[11,12] Once again we have to start from the unit's objectives. If you operate MBO, in any form, then the unit objectives will have been defined and can be used for PPBS. The next stage is to list the activities of the information unit and ensure that each of them is justified in terms of the objectives. This can be a useful stage at which to review your activities to see whether any of them are now no longer necessary, or need modification to fit changed requirements.

There are several ways in which a manager could analyse and list the activities of his department. When I carried out this exercise I divided them into two main categories—operational and service. The former consists of four main groups or programmes, namely acquisition of materials; preparation of indexes; stock control and maintenance; and evaluation of services and systems. The latter has five programmes—current awareness; information retrieval; reference and loan; supply and distribution; and training and advisory. Each of these programmes has a number of elements; for example current awareness has three elements: SDI, abstract bulletins, periodical circulation. For each of these elements costs are ascertained for staff, stock, equipment, etc. and then the total cost of the activity is derived. As I was particularly interested in the full cost of the various information services provided I went a stage beyond this and found out the proportion of operational costs which supported each service. These were then transferred to the service elements thus giving the complete costs. In some cases it turned out to be surprisingly lower than I would have guessed, and the converse was true as well.

When all the activities have been costed in this way, the manager, having checked to see that the total of all the costs equals his traditional budget total, is in a position to do several things. First he can cost alternative and/or modified methods for providing the same service. This would demonstrate whether what he is doing is cost-effective or not, because another method which is cheaper, but still preserves the quality of the service, may emerge from his analysis. This could of course be an external commercial service as an alternative to an in-house service. Secondly by adding to each factor in the costing the appropriate percentage increase for each of, say, the next five years, he can see if unacceptable increases in costs are likely to occur for any particular service, and also estimate his future budgets with a higher degree of accuracy.

All this derives from PPBS. There is however a further stage beyond PPBS which can help the manager when he is called upon to justify a particular service, or his costs for a particular activity. It is not an easy stage because the information required is often difficult to obtain. The manager looks at the use made of each of his information services, and then calculates what it would cost the users to obtain the information for themselves *if the service did not exist.* The difference between the cost of supplying the service and the costs when no service exists can be regarded as the cost-benefit accruing to the service. The total of all the differences will give the cost-benefits which arise from the information unit as a whole. As I said earlier we still do not have any accurate way of measuring the value of information supplied to a customer, but the cost-benefit of the service is the next-best-thing, and the value of the information, whatever it is, should be a bonus on top. But when it is suggested to an Information Manager that he could stop a particular service, he has figures to show what it will cost to do without the service.

Conclusion

There are many other management techniques that can be used in the operation of information services. If I had attempted to cover them all, this paper would have read like a catalogue. If I missed out your favourite technique, I apologize; but naturally I preferred to discuss those of which I have made use myself. Also, although I have spoken separately about techniques relating to systems, services, staff and finance, I would not wish to give the impression that they operate independently. PPBS, for example, although concerned with costs, covers all the other categories to which I have referred. And it is possible to build up your own package of interrelated techniques. Maurice Magson has recently written about the linked use of MBO, work measurement, activity sampling, critical examination and programmed budgeting.[13]

Finally in evaluating or implementing any technique for use in your unit please do bear in mind that the quality of a service is more important than any quantitative measurement, and that staff morale and their trust in you as their manager, are fragile things, which once broken take a long time to recover.

REFERENCES

1 BURNS, R. W. A generalised methodology for library systems analysis. *College and Research Libraries*, 32(4), July 1971, 295–303.

2 GULL, C. D. Logical flow charts and other new techniques for the administration of Libraries and Information Centers. *Library Resources and Technical Services*, 12(1), Winter, 1968, 47–66.

3 MUMFORD, E. *Systems design for people.* National Computing Centre Ltd, 1971.

4 LEIMKUHLER, F. *Mathematical models for library systems analysis.* School of Industrial Engineering, Purdue University, 1967. PB176113.

5 BUCKLAND, M. K. *et al. Systems analysis of a University Library.* University of Lancaster Library, 1970.

6 BUCKLAND, M. K. An operations research study of a variable loan and duplication policy at the University of Lancaster. *Library Quarterly*, 42(1), January 1972, 97–106.

7 BROPHY, P. *et al. A library management game.* University of Lancaster Library, 1972.

8 BRITTAIN, J. M. *Information and its users.* Bath University Press, 1970. (Chapters 1 and 2).

9 MASON, D. Problems of getting—and keeping—staff. *Aslib Proc.*, 18(1), January 1966, 6–15.

10 HUMBLE, J. *Improving business results.* McGraw-Hill, 1968.

11 MASON, D. PPBS: application to an industrial information and library service. *J. Librarianship,* 4(2), April 1972, 91–105.

12 MASON, D. Programmed budgeting and cost-effectiveness. *Aslib Proc.*, 25(3), March 1973, 100–110.

13 MAGSON, M. S. Techniques for the measurement of cost-benefit in information centres. *Aslib Proc.*, 25(5), May 1973, 164–185.

DISCUSSION

MR H. CEMACH (Anbar Publications) said that the O & M officer who rang that bell should have been sacked on the spot for bastardizing two perfectly good work measurement techniques, viz, self-recording and random sampling, which, separately are quite sensible but which, taken together, form a nonsense.

MR D. MASON suggested that perhaps one should not take the example too seriously!

MR G. WHATMORE (BBC) said that many of us are faced with the need to quantify operations in which there is a large intellectual content, e.g. indexing. Are there any techniques available to study indexing and classification operations by work study methods?

MR MASON replied that much has been written on the comparison of indexing systems, from the Cranfield report onwards, but there is little on indexing as a process susceptible to time or work study. How can one measure the quality of an indexing system objectively?

MR G. WHATMORE then asked if there is any standard costing rate for inquiries? The speaker suggested a figure of £1 per inquiry. Is this a relatively common figure?

MR MASON said that he believed that figures were available although he could not recall them precisely at the moment.

MR R. G. GROEGER (John Laing) said that in establishing a cost benefit it is often possible to produce figures for overall costs but it is sometimes better to produce one or two specific cases of cost saving through the use of the information system. The keeping of time sheets is useful since it enables one to do this.

MR MASON agreed that specific examples can be useful but experience shows that they can be overplayed. They must be used discreetly. It may not be necessary to keep time sheets throughout the year: keeping them for a short time each year so that one year can be compared with another may be sufficient.

MISS D. M. GAUNTLETT (Kodak) said that they had found the use of record forms (for use in handling inquiries) has a number of advantages. One of these is as an aid to the younger information worker in acquiring a systematic approach to dealing with inquiries.

MR MASON agreed but said this is not quite the same thing as keeping *Timesheets.*

MR R. F. ATKINS (Sheffield City Library) said it is understandable that staff should be apprehensive about the introduction of certain management techniques; redundancies do occur even in local government. However benefit can sometimes accrue to the staff as well as to the organization. In Sheffield City Libraries the Corporation's MBO adviser recently carried out a pilot survey on a particular section of the library. The adviser got on well with the staff who accepted him quickly and he in turn was impressed both by what he saw and by the staff's attitude to their work. The results were an agreed course of action and a large measure of goodwill for the library service.

MR O. N. BLATCHFORD (Forestry Commission) commented that for the Information department which wants to keep records but lacks the time to do so, a mechanical counting system (e.g. a battery of hand tally counters) is to be recommended. The novelty appeals to staff and overcomes (for short periods at least) the tedium of keeping records.

MRS H. P. HOGEWEG DE HAART (Royal Netherlands Academy) said that a difficulty arises in comparing the cost of finding information for (a) the user doing it all himself and (b) the work being done by the information department. The user, especially in the social sciences where the answer is seldom precise and clear cut, would simply not ask the question if he could not get a cheap answer. Is it right therefore to consider the 'saving', i.e. the difference between (a) and (b) as an asset on the information department's account?

MR MASON said that it is within the user's discretion to decide which course he will pursue. If he does not ask the question he may be duplicating work and wasting time. Many people *do* decide not to embark on a search or ask the information department, especially if it is more painful to have the information than to do without it. This phenomenon is allowed for in the calculations.

MR M. RIGBY (American Meterological Society) asked how could one evaluate the benefits which might derive from continuity of a service or cumulative value of a given data base (over a period of, say, 5–10 years) against the lack of cumulative benefits which arise when an efficient, cost-effective service is changed every two to three years because of reorganization, innovation, new management or new systems being introduced? Is stability, or potential for continuity, a factor considered by management consultants in making recommendations? Planning for a stable entity requires investment over a longer period than would be necessary in planning for a get-rich-quick exercise that may not survive long enough to be really productive or valuable.

MR MASON replied that too much change is just as detrimental as no change at all and makes it difficult to compare performance one year with another. The management consultant recognizes that all forecasting is based on imprecise information and he just has to do the best he can.

Marketing Manager at Aslib

For the first time since the onset of the industrial recession some three or four years ago, it seems possible to plan for a resumption of the earlier expansion of Aslib with good prospects of success.

It is therefore proposed to appoint at headquarters a Marketing Manager to undertake systematic campains for the recruitment of new member organisations, with priority towards industry and commerce, and to promote the maximum use of Aslib's income-earning services. Aslib has members in some 75 countries; this appointment is intended initially as the first major step towards further expansion of membership in the UK and other EEC countries.

A good knowledge of the information field and of Aslib's role in it is highly desirable; experience in market research or marketing would be useful, as would the effective use of one or more European languages. Flair, imagination and a capacity for persistent hard work are at least as important. Starting salary up to £4,000 per annum with exellent pension scheme. Please apply in writing to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL.

Information services to management consultants

John Blagden

Greater London Council

Paper presented at the 47th Aslib Annual Conference, University of Bath, 23rd–26th September 1973

MANAGEMENT consultants have been described as 'the people who borrow your watch to tell you what time it is and then walk off with the watch'. But Robert Townsend's[1] refreshing anti-management text makes equally damaging remarks about directors, advertising, purchasing and management. The Management Consultant Association[2] however, report that in 1972 fee income reached a record £30.3 million.

In my view management consultants, properly selected and briefed can make a real contribution to the health of an organization. They can provide:

1 impartial advice on a particular organization's management problems and assistance in solving these problems once the preliminary crucial diagnosis has been completed;

2 help especially to the smaller firm on specific projects because there are inadequate internal resources available and no permanent need for such resources;

3 an overall audit even when performance is good by anticipating road blocks that are likely to occur in the future.

Management consultants offer a wide range of services covering the whole management arena including organization corporate planning, production, marketing, finance and personnel. They utilize in their work a wide range of techniques drawn from such differing areas as behavioural science and operational research together with a few gimmicks.

The structure of the consultancy profession is equally diverse in that according to the BIM[3] over 50% of consultancy firms employ less than five people. 5% of consultancy services emanate from universities and polytechnics and roughly an equal proportion spring from accountancy based firms—a surprisingly large number approaching 10% are owned by commercial or industrial companies and one of the best known examples is the UK in Leasco's ownership of the Inbucon group.

The main published source available on management consultants is a book by Smith,[4] and even the Kompass register contains a longish list if that is what you are looking for. Choosing a consultant from a directory however carefully the list is compiled is clearly an inadequate basin for selection. The MCA offers an information service but inevitably in most cases it will restrict its recommendations to its 25 member firms although admittedly many of the larger firms are included in its membership.

In my view the most reliable source of information on consultants is the Management Consulting Services Information Bureau where details of over 1,000 firms are recorded. The Bureau is jointly sponsored by the BIM and the CBI and it takes a wide view of management consultancy including firms specializing in desk market research, executive search, quality control and industrial relations. What however makes the service unique is that in a large number of cases user assessment reports are available on the services given by these consultants.

The BIM service generally works on what seems an eminently reasonable premise that it will only recommend firms for a particular assignment if they have on their records at least one favourable assessment report in the area appropriate to that assignment. The service is open to all enquirers irrespective of membership of the CBI or BIM. Up until this month the service was entirely free but I regret to say that for assignment enquiries the Institute has now introduced a £10 charge per query.

Diversity then is the keynote of management consultancy as it is practised in the UK. McKinsey, the firm with which I had direct experience, is an international firm with 16 offices situated in North America, Europe, Australia and the Far East. It is a partnership but is a single legal entity to facilitate the interchange of information, experience and personnel amongst the 16 offices. McKinsey confines its work to top management problems, i.e. all matters of proper concern to the Chairman, Chief Executive Board and senior managers of, in the main, larger organizations.

This concentration on top management issues is reflected in the major problem areas that the firm tends to be involved in such as:

1 multinational business, i.e. the increased internationalism of business has in turn produced a wake of organizational and other issues;
2 corporate strategy, i.e. how to plan for growth especially in the context of increased competition;
3 information systems, i.e. what information and what systems are needed to plan and control a business;
4 consumer marketing issues such as pricing strategy, distribution, and sales force deployment;
5 management of technology, innovation and research and development management in general;
6 Personnel—the whole area of human resources and in particular management development and compensation;
7 profit improvement/cost reduction.

The client range includes a substantial number drawn from the public sector and it would certainly be wrong in McKinsey's case to associate them exclusively with the private sector.

What then are the unusual features of offering an information service to consultants operating in this somewhat rarefied environment. The one firm concept had a considerable impact on the nature of the service offered. For example, enquiries emanating from overseas offices were given the same priority as those received from UK based staff. We did, however, operate a priority system in dealing with enquiries which was *not* a first come, first served, basis. Client work always took priority over any other work, practice development, i.e. research to support a traditional area of expertise approved by a partner came next, followed by a whole range of other categories.

Near the bottom of the list came internal office procedures and this meant that quite often it was very difficult to keep abreast with library housekeeping routines such as cataloguing, shelving, and filing. Yet although the priorities were sensible if the housekeeping routines were not kept up-to-date in the long term it would be difficult to meet client and practice development needs.

The one firm concept also meant that consultancy staff were constantly being moved to other offices so that as far as possible the most appropriate staff manned a particular study wherever it might take place. In addition, many of the consultants working on UK studies would be based for long periods at the client, often outside London. The increased internationalism of business, i.e. examining markets and organizational questions in terms of the world rather than the UK meant that even those consultants working for UK clients would not necessarily remain in this country. The reverse of course also happened that consultants working for non UK clients could be based in the UK and might stay for two days or two years. This high degree of mobility presented numerous problems in trying to recover library material especially as usually a team of consultants engaged on one study would tend quite naturally to pass material amongst themselves.

A key library responsibility was to ensure that internal documentation generated in the client studies was fed into the corporate memory again reinforcing the one firm concept. Regular printouts were received from New York and what was interesting about this system was that document retrieval was a small but integral part of the internal management information system.

Other retrieval devices were a library catalogue severely handicapped by the Baker library classification which was employed throughout the firm because of a misguided deference to Harvard Business School. In addition we operated a conventional peek-a-boo system where we utilized the National Computing Centre's thesaurus management service. The thesaurus thus had three displays (1) EJC format, (2) hierarchy and (3) an index to the hierarchy. It was important in developing this system that approaches and techniques in one area were transferable through the medium of the information retrieval system to other areas. One simple example will hopefully make this clear. We stored within the system a great deal of information on the role of chief executives in both the private sector and local government. We therefore semantically factored the term Town Clerks to Chief Executives + Local Government and Managing Directors was similarly treated as Chief Executives + Private Sector. Thus in searching for information on chief executives you would be alerted to the existence of approaches developed in both sectors.

Coverage was an acute problem because although clearly we had a continuing interest in management the rest of our coverage was largely determined by our client mix. Many of our private sector clients, for example, defined their objectives in terms of increased market share or return on capital but one of our clients defined their main objective as 'to continue to search for the holy grail'

Finally, two other problems:

1. *Confidentiality.* It was the library's responsibility to ensure that all client material remained confidential. Clear guidelines were laid down about this both in terms of the outside world and in terms of possible conflict of interest situations amongst McKinsey teams.
2. *Author cataloguing of* client reports presented problems not only of the parent subsidiary variety but the much more daunting problem of changes in client names and relationships because of the spate of mergers and divestments that have taken place in recent years.

I have deliberately not attempted to give you a comprehensive picture of the information services within McKinsey but have attempted to highlight the unusual. Hopefully the short postscript that I am now going to introduce on cost benefit measures will act as a convenient bridge between today's session and tomorrow's.

I have already mentioned the problems that our priority system produced in terms of dealing with library housekeeping routines. Managers of information service units have exactly the same problem as other managers have. Thus all managers are so pre-occupied with the day-to-day that we have little or no knowledge of how effective we are in contributing to the health of the organization for which we are working.

As long ago as 1844 a Frenchman called Dupuit advocated the totalling up of the benefits of a transaction and subtracting from that figure the costs. Taking all the costs and benefits into account if the final figure was positive the transaction was worthwhile. We were fortunate at McKinsey to have a first-year undergraduate economist whose brief (during the summer vacation) was to see if he could come up with some answers to the question of costs and benefits of the library and information service. Costs were relatively easily established for most library activities associated with:

Books and pamphlets
Inter-library loans
Periodicals including circulation
Annual reports
Client reports
Internal training documents
Moodycards
McCarthy: a press clipping service
Periodical articles.

These costs included labour costs which were based on time taken on these activities. The time taken was estimated by the staff actually involved in the tasks. Ideally these time calculations would perhaps have been more accurate if we had used a form of activity sampling or simple observation but resources were simply not available for anything sophisticated. These times were multiplied by a figure based on salary and fringe benefits and overheads.

This, in turn, was multiplied by the annual throughput so that all the cost data was based on one year.

We then came to the crucial, perhaps unanswerable, question of benefit and it was at this stage that we involved our users. We provided each consultant with a list of the services and requested them to distribute 100 points amongst the services in any way they wished to reflect the benefit that they had received from these services. They could allocate 100 points to one service and none to the others or any other distribution—we did insist that they used up their 100 points. When these were returned we produced an average number of benefit points per service. These points were then divided by the already calculated cost figures which yielded a cost per benefit point.

Thus we were able from this analysis to form some tentative conclusions on the relative effectiveness of our services. It provided us with some evidence as to which service should be thrown out of the balloon first in a scarce resource situation. The problem of involving the user directly however is that they may well give low scores to some services simply because they were unaware that this was the source from which valuable information was obtained. I would have liked to compare the distribution of these benefit points with actual use as reflected in our loan records. User perception of benefit or even actual use is still a long way from determining whether the information disseminated by the library was of value to McKinsey and the client. Nevertheless, in the equivalent of about 2-man months we did establish some useful management data:

Costs of various activities
A crude user satisfaction measure for these services.

In addition we produced some evidence on the economics of borrowing *v.* buying in that the cost of borrowing was roughly equal to acquisition and processing costs. If therefore a book was likely to cost less than £1.50 it was certainly cheaper to buy. Just to add to the confusion however we also discovered that about a third of our book stock had never been borrowed.

I have partly produced this postscript to muffle cries of 'physician heal thyself' or 'why doesn't the shoemaker's son wear shoes?' I do however also believe that unless we become more results-orientated as Bryan Yates indicated this morning rather than activity-orientated that special libraries will continue to be the Cinderella when the competition for resources intensifies.

REFERENCES

1 TOWNSEND, ROBERT, *Up the organization*, Michael Joseph, 1970.
2 Management Consultants Association. Chairman's statement and annual report. MCA 1972/3.
3 British Institute of Management. Survey of the consultancy information held within the MCSIB, 1972.
4 SMITH, R. *A register of management consultants*, Gower Press, 1972.
5 BLAGDEN, J. Special libraries. *Library Association Record*, July 1973, 132–133.

DISCUSSION

MR R. SEWELL (British Steel Corporation) said that he wanted to clear up one point relating to the allocation of points to specific items. Is it true that, for instance, if the user had allocated 30 points to the loan service and a single loan cost £1.25, the cost benefit factor would be 30/1.25?
MR BLAGDEN Yes.

DR D. J. CAMPBELL. You describe a system of assessing the value to users of different information services in which the users *had* to distribute 100 points among the services. This gives one kind of answer (presumably the kind wanted?). I suggest that a different kind of answer might be had by asking users to distribute *up to* 100 points among the services. The points awarded might vary from, say, 80 to none at all.
MR BLAGDEN replied that they were, in fact, going to try the alternative system mentioned by DR CAMPBELL but that he left the organization before this could be done.

MR O. N. BLATCHFORD (Forestry Commission) asked what services were surveyed under the 100 points system?
MR BLAGDEN replied books and pamphlets; interlibrary loans; periodicals; annual reports; client reports; Moodycards; etc.

MR LAURIE (Bowker) asked two questions. First, were clients allowed to use the library services? and secondly, did consultants hand over, at the end of a project, material they had gathered during the project?
MR BLAGDEN replying to the first question said, yes, up to a point. And to the second, yes, it was a library responsibility to ensure that this material was gathered and fed into the corporate memory.

MR ASHTON asked whether consultants kept collections of documents?
MR BLAGDEN replied no, the library was the sole custodian.

MISS A. FENDER (Pfizer). How did you achieve the high percentage response to your questionnaire? Was it a case of 'personality' or one person being involved coupled with an effective chasing system?
MR BLAGDEN said he enlisted the help of one of the Partners which gave the thing more weight, but, also, the consultants were all fairly enthusiastic about the information service.

MR N. L. ANGEL (Shell Research) asked is it reasonable to ask users to allocate benefit points to the various activities of the library and information service when these are expressed in traditional operational terms (e.g. maintaining an index)? Users were only interested in the level and competence of the services provided and not in the means employed. Has consideration been given to asking users to evaluate the services in user-oriented terms, e.g. current awareness, retrospective searches, short term inquiries, etc?
MR BLAGDEN agreed it would certainly be desirable to do this and to see if there was any correlation with users comments in the actual survey carried out.

BRIEF REVIEWS

COMMONWEALTH DIRECTORY OF PERIODICALS: a guide to scientific, technical and professional journals published in the developing countries of the Commonwealth. London: Commonwealth Secretariat, 1973. 157 pp. £2.50. (ISBN 0 85092 062 0)

Great care has gone into the compilation of this directory, containing details of some 850 current titles of scientific, technical and professional journals, published in the developing countries of the Commonwealth. The compilers have included only those titles where a current issue of the periodical has been seen. For this purpose they have visited such libraries as the Institute of Commonwealth Studies Library and the India Office Library, as well as the National Libraries. The tendency has been to exclude publications about which there is any doubt of current existence; also *Annual Reports* and irregularly published *Transactions*.

The general layout follows that of *Ulrich's International Periodicals Directory*, with titles allocated to one or more of the 75 chosen subject headings, cross references being used as necessary. The main entry for each periodical also includes the subtitle, the address for ordering copies, sponsoring organization, number of issues per year and the price. An alphabetical title index completes the publication, giving country of origin and a unique entry number for each title.

Those contemplating the purchase of this directory will probably want to know whether its coverage differs appreciably from that of *Ulrich's*. There is a large number of common titles in the two publications while other titles appear in only one or the other. One must bear in mind however that tracing details of journals from many of these countries is very difficult, if they are not recorded in the international sources. Certainly there is information in this directory not readily available elsewhere.

KARLAUGUST SCHLOESSER. *ed.*, Selbstdartellung fachspezifischer bibliothekarischer Verbände der Bundesrepublic Deutschland. Berlin: ASpB. Hergestellt von der Arbeitsstelle für das Buchereiwesen, 1973, 43 pp.

This booklet presents a survey of German library associations, their interests and their structure. There has been a lack of information on these specialist organizations, and the Arbeitsgemeinschaft der Spezialbibliotheken (special libraries working party) as part of their remit to make use of the common ground between the special libraries and to promote contact between them, are trying to bridge the gaps by presenting this review of the library associations' interests and activities.

The organizations treated cover documentation in such areas as theology, law, art, medicine, music, education, and government, and each entry provides a brief history of the organization and a description of its activities, with a pictorial representation of its structure. The details presented should make the publication useful to anyone involved or interested in the work of the Federal German library associations, presenting information not found elsewhere hitherto.

THIRSK, J. W., *ed. & comp., CICRIS Directory and Guide to Resources.* 3rd edition. London: Co-operative Industrial & Commercial Reference & Information Service, Acton District Library, 1973. 49 pp. 80p. (ISBN 0902941 02 X)

The CICRIS Directory is a sort of localized Aslib Directory, giving details of the interests of CICRIS members. This is the third edition of the Directory, which first appeared in 1968, and apart from the centre pages, which are devoted to a history and description of CICRIS, it consists of a guide to CICRIS members arranged in order of membership number. Each entry contains name, address, telephone number(s), telex number where applicable, details of preferred form of receipt of loan/enquiry requests, hours, main subject interest of library stock, special collections, and photocopying/microform reading equipment. There are 262 such entries and they are indexed alphabetically and by subject at the end of the booklet. As a guide to the resources of a limited area, this directory should prove very useful.

WILSON, R. S. & OTHERS. *ed., Public Affairs Information Service Foreign Language Index 1972.* New York: Public Affair Information Service Inc., 1973. 2 vols., 180 pp. and 176 pp. $100 per volume.

The Public Affairs Information Service Inc. have now extended their field of operation by publishing the *Foreign Language Index* as a counterpart to the well known *PAIS Bulletin.* Volume one appeared as a single volume, covering the years 1968–71, indexing articles in French, German, Italian, Portuguese and Spanish, in the fields of economic and public affairs, from approximately 650 journals. With volume two, however, the publication assumes what is proposed to be its permanent format; that is quarterly issues, with the fourth quarterly being an annual cumulated and bound volume. In this volume too, indexing is extended to cover a selection of books, pamphlets, government publications and reports, as well as periodical articles.

The *Foreign Language Index* uses the same subject headings as the *Bulletin* covering the same field as its well established counterpart: the principal difference between the two publications being that more emphasis is placed on authors of items in the newer Index. Where known, authors are given first in the entries and each issue includes an alphabetical index to authors, which cumulates in the annual: a very welcome innovation for all users.

Linguists will be pleased to see this new tool standing in what is a serious gap on the library shelves; however, for the less fortunate non-French, German, Italian, Portuguese or Spanish readers there remains the old barrier: although subject headings are given in English, the titles of articles, which in most cases are the principle means by which relevance of items can be assessed, are given in the original language. It is pleasing to note, however, that the PAIS Inc. continues the policy adopted in the *Bulletin*, of clarifying ambiguous and sketchy titles with clear, concise annotations in English, thus greatly enhancing the value of the publication.

Paint Research Association

LIBRARIAN

We require a librarian to maintain and participate in the development of the library and information Services.

The library has the most comprehensive collection of literature in the world on surface coatings and related subjects.

The successful candidate, who will report directly to the Head of Information, will be responsible for a wide range of duties, including book selection, maintaining journal and trade literature, preparation of bibliographies, loans from other libraries and maintaining close links with members of the Paint Research Association. Experience in surface coatings technology desirable but not essential.

The commencing salary will be commensurate with qualifications and experience. Please apply to Head of Information Department, Paint Research Association, Waldegrave Road, Teddington, Middx. TW11 8LD. Telephone 01-977-4427.

TECHNICAL TRANSLATOR (HIGHER SCIENTIFIC OFFICER/ SENIOR SCIENTIFIC OFFICER)

is required by the United Kingdom Atomic Energy Authority Reactor Group Headquarters at Risley, near Warrington, Lancashire.

The post is within the Library and Information Department. Duties will include oral and written translations for Engineers and Scientists throughout the Group, and the scanning and selection of current literature. The subject matter covers a wide range, including chemistry, physics, metallurgy and most branches of engineering.

A sound knowledge of technical German and French is essential and additional languages of technology will be a distinct advantage.

Applicants should normally have one of the following qualifications:

a. A degree in an appropriate subject.
b. Degree-standard membership of an appropriate Professional Institution.
c. A Higher National Certificate or a Higher National Diploma in an appropriate subject.
d. A qualification equivalent to at least c. above.

Applicants must also have undertaken post-graduate work or had other relevant experience since qualifying, the minimum periods being as follows:

a. Applicants with 1st or 2nd class honours degrees or equivalent qualifications should have had at least 2 years' post-graduate experience;
b. Other applicants should have at least 5 years' appropriate experience after qualifying.

Salary will be assessed within the scales:

Higher Scientific Officer - £2,225 to £2,855
Senior Scientific Officer - £2,800 to £3,895

according to age, qualifications, experience and additional languages.

Please write for Application Form, quoting reference S4601AP to Staff Officer, Room E303B, United Kingdom Atomic Energy Authority, Reactor Group Headquarters, Risley, Nr Warrington, Lancashire.

Closing date for the return of Application Forms: 7 December 1973.

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{array}{l}\text{specific}\\ \text{recent}\end{array}\right\}$ information

in the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

University of Rhodesia

University Library, Salisbury

Applications are invited for vacant posts of *SUB-LIBRARIAN.*

The salary scale is £4368 × 159–£5004—(Approx. stg. equiv.). The commencing salary will depend on qualifications and experience.

Applicants should have five years' post-qualifying experience, preferably in the administration of reference and information retrieval services in scholarly or research libraries, and in the organization and supervision of professional, technical and clerical staff.

Detailed applications (6 copies) should include a full curriculum vitae (including full names, place and date of birth, etc. and naming three referees whom the University may consult) and should be submitted to the Senior Assistant Registrar (Staff), University of Rhodesia, P. O. Box MP 167, Mount Pleasant, Salisbury, Rhodesia, by *14 December 1973*, from whom further particulars of the post and information on pension, medical aid, leave, study leave and allowances, and travelling expenses may be obtained. Additional copy to Association of Commonwealth Universities (Appts), 36 Gordon Square, London WC1H 0PF, from whom further information may also be obtained.

When applying please quote Ref. No. UK/26/73, and state where advertisement seen.

British Librarianship and Information Science

1966–1970

EDITED BY H. A. WHATLEY

A review of progress in the late sixties

£8 (£6.40 *to L.A. Members*)

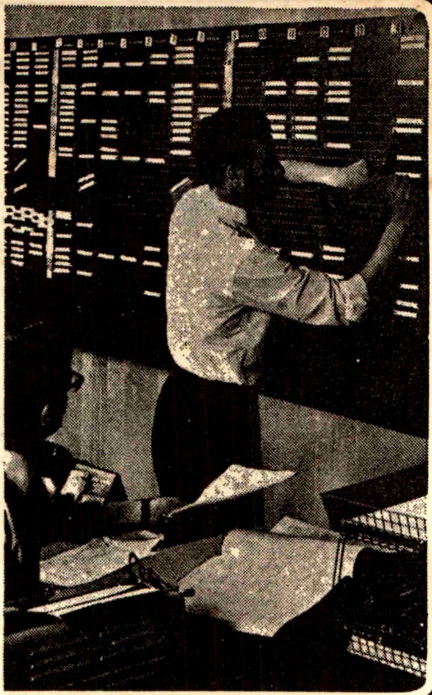
Still available

Five Years' Work in Librarianship 1961–5

EDITED BY PHILIP SEWELL

£5.75 (£4.60 *to L.A. Members*)

THE LIBRARY ASSOCIATION



Library Removals start here

In Bullens planning office.
Every move is planned in detail;
problems of access or timing overcome;
men, vehicles and equipment allocated –
well before the move begins.
So you move safely, quickly and with least
disruption.
That's the difference between Bullens
and any other contractor.
Phone today.

Bullens
TRANSPORT SERVICES

Bullens Transport Services Ltd
408, Hornsey Road,
London, N.19 4EB
Tel: 01-272 6671

*Also at Bristol, Hinckley
and Newton-le-Willows.*

A Gillspur COMPANY

FIRST for carpets
Dodson Bull

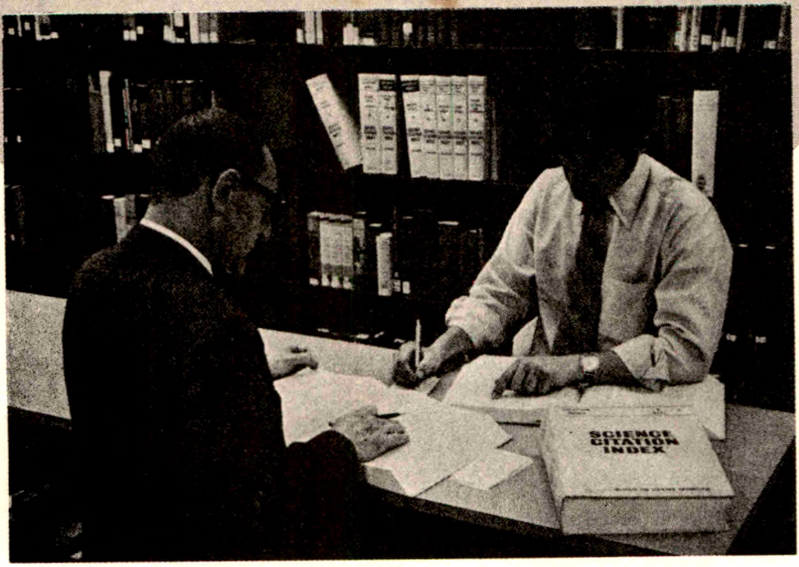
UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display
In our extensive London and provincial showrooms
Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.
LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5862
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 66402
BRISTOL: 2-3 Royal London House, Queen Charlotte St BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LG.
Tel: Southend 46569
9.00-5.30 Mon.-Fri. Sat. 9.00-12.00 (Manchester 9.00-4.00).

SCIENCE CITATION INDEX®...
the reference that sheds a whole new light
on literature searching...



belongs in every scientific library

Science Citation Index—the uniquely effective search tool that organizes the world's current scientific journal literature by the authors' own reference citations—retrieves more pertinent articles on almost any given subject, faster, than any other reference of any kind.

It's the one multi-disciplinary retrospective search tool that serves **all** departments because it covers all scientific subjects with unmatched authority. It's the one reference that finds material that gets lost in the limitations of conventional, subject-oriented literature indexing systems.

SCI® makes use of an indexing system that follows scientists' own traditional method of literature searching—that of locating articles related to their subject interests by examining reference citations of articles known to be relevant. The technique is called "citation indexing". And the **SCI** is the only comprehensive index to the journal literature that offers it.

The **Science Citation Index** is the one standard literature-search reference that no library serving the scientific community can afford to be without. If your library doesn't yet have this most useful of all literature retrieval tools . . . used by libraries large and small . . . bring your search capabilities up to date now. And plan extra sets for branch and departmental libraries where they can do the most good for your entire organization. (Special matching grants are available to smaller departmental and branch libraries to make it economical to obtain multiple sets of **SCI**.)

For more on what the **Science Citation Index** can do
for your library, send for our new brochure.

©1971 ISI

isi® **Institute for Scientific Information**
Dept. 13-300, 325 Chestnut St., Phila., Pa. 19106, (215) 923-3300

The most useful reference for libraries requiring information on EDP equipment:

THE AUERBACH EDP NOTEBOOK/EUROPE

3 Vols. Monthly Updates. £98 p.a. Subscription

Equipment covered:

- **General Purpose Computer Systems**
- **Small Business Computers**
- **Minicomputers**
- **Remote Batch Terminals**
- **Intelligent Terminals**
- **Typewriter Terminals**
- **Extended Core and Replacement Memories**
- **Magnetic Tape Systems**
- **Disc Systems**
- **Card Handling Equipment**
- **Key-to-Storage**
- **System Software**
- **A/N Displays**
- **Optical Character Recognition**

Detailed subject indexes and sensible chart and report structure make information fast and simple to locate. The looseleaf format makes the filing of updates easy to accomplish.

Library inspection copies (30 days approval without obligation) are available on request from:

AUERBACH Publishers Inc.,
44 Wallington Square, Wallington, Surrey, England.
Tel: 01-669 2888 Telex: 946445.

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford

Aslib

Proceeding

CALCU[illegible]
CENTRAL
LIBRARY
UNIVER[illegible]

47th ASLIB ANNUAL CONFERENCE

The information services provided by public libraries to industry and commerce *A. L. Smyth*

Information for Members of Parliament: the service provided by the House of Commons Library *David Menhennet*

Information services for the universities *Susan M. Evans*

Towards informatics 2 *Kevin P. Jones*

Short loan collection *W. B. Woodward and M. Hird*

DECEMBER 1973
VOL. 25, NO. 12

Full data on all patents from 24 countries in minutes!

Derwent Publications introduces the world's fastest and most comprehensive information service on patents.

Now that patent specifications filed in Japan and many European countries are published so rapidly, they are replacing conventional trade and scientific journals as sources of information on new ideas and latest developments. Also, they provide advance information on related patent applications which will be published much later by the United States and United Kingdom patent offices.

This new interest in patents has intensified the need for a simple international patents journal wherein the whole of the patent literature of the World can be scanned, and items of interest followed up, in a unified system.

From January 1974 Derwent will be providing a new integrated service–World Patents Index–which will completely meet this need.

Each week computer-generated and phototypeset WPI covering *all* subjects will give fully indexed information on over 12,000 patents published 4–5 weeks earlier in 24 major countries. In a single gazette WPI will contain indexes which will allow in a matter of minutes searching by patentee, subject matter and keywords and will identify families of patents.

Back-up information for WPI in the form of English language abstracts for chemical subjects is provided by the highly successful Central Patents Index, operative since 1970. A companion service for non-chemical subjects–General Patents Index–will commence at the same time as WPI. Each week GPI will publish, in book and card forms, abstracts plus drawings, available for convenience in three separate sections–General, Mechanical and Electrical.

Additional services to subscribers include:

High speed central bureau patent searches
Selective monitoring by subject, country or patentee
Copies of patent specifications on request.

No other source is able to provide patents information of such depth, accuracy and speed. Furthermore, the many advantages of these outstanding services can be obtained for a really economical subscription equivalent to only a few pounds a week.

Samples of WPI and GPI are available for you to evaluate without obligation and completely free of charge.

Write now (quoting DN) for brochure, giving full details of these services and subscription rates, and for the free samples.

Derwent Publications Ltd.

Rochdale House, 128 Theobalds Road,
London WC1X 8RP, England.
Telephone: 01-242 5823 Telex: 267487
Cables: DERWENTINF, LONDON.
A part of The Thomson Organisation.

DERWENT **World leaders in patents information.**

CW 2N

CENTRAL LIBRARY UNIVERS

Aslib Proceedings

VOLUME 25 DECEMBER 1973 NUMBER 12

© 1973 Aslib and contributors

Aslib Proceedings *is published monthly and supplied free to members of Aslib. Subscription rates are £12.50 annually to non-members, or £4.00 to Aslib members requiring additional copies. Single copies £1.25, or 40p to members.*

Further information about Aslib's services and membership rates will be supplied on application to the Director, Aslib, 3 Belgrave Square, London SW1X 8PL. Tel. 01-235 5050. Telex 23667; answer back, Aslib London.

Notes for contributors

Aslib Proceedings now accepts contributed papers in addition to those presented at Aslib meetings and conferences. They should be of a practical nature and of some relevance to problems encountered in the everyday operation of library and information units, or services. Other kinds of contribution which will be considered for inclusion are short notes on new information units or special libraries; the introduction of new techniques or systems in existing libraries where these may be of general interest; equipment designed by members for special purposes and put into operation in their own organizations; and objective reports on experience with new 'packaged' commercially available information services.

Contributions, which should be typewritten, double spaced, single-sided on A4 paper, and not more than 3,000 words in length, should be addressed to the Editor, *Aslib Proceedings*, 3 Belgrave Square, London SW1X 8PL. If possible, authors should include a summary of up to 200 words with the typescript. Authors will receive twenty-five offprints of their article free of charge.

The information services provided by public libraries to industry and commerce

A. L. Smyth

Commercial Librarian and Information Officer,
Manchester Public Libraries

Paper presented at the 47th Aslib Annual Conference, University of Bath, 23rd–26th September 1973.

THIS IS very much a personal view of public library service to commerce and industry and does not attempt to give a considered survey of the position in the country as a whole. It is almost impossible to generalize for there seem to be almost as many policies as there are public library systems and the priority given to this service compared with all the other diverse services to the community which a public library is expected to give, varies from authority to authority. At one extreme there are those who appear to take the view that ratepayers' money should not be spent in contributing further profits to rich companies and, in any case, if such a service is required it is not the responsibility of local government. Other public libraries claim to give a service to commerce and industry but, in fact, make very little positive provision in the way of staffing and stock. Probably a minority of authorities are far-sighted enough to appreciate that business enterprises pay a large share of the local rates and employ the majority of domestic ratepayers, and that money spent in providing this kind of service is a sound investment in the economic vitality of an area. The proportion of libraries appropriate to each of these three categories is difficult to assess but Dr Clements found that 4 public libraries out of 33 surveyed dealt with 56 per cent of the commercial and technical enquiries.[1] Quality of service is not necessarily related to size of system and there are a few comparatively small libraries which maintain excellent co-operation with local industry. Next year there will be a revolution in local government outside London and the number of library authorities will be reduced from 381 to 117. The elected representatives and most of the chief officers of these new authorities have now been chosen and will take office on 1st April 1974. New policies are already being discussed and if you feel dissatisfied with your present service, now is the time to act.

This paper is purposely and unashamedly biased in its emphasis on business information, a field in which the public library is still the only kind of public funded library giving anything like a comprehensive service. You must forgive me for quoting statistics relating only to my own library because it has recently been the subject of a first-class survey of use and users by the Aslib Research Department[2] and I am not aware of any similar survey in anything like such detail. It might seem strange to those in business enterprises that the public librarian knows comparatively little about his customers and potential customers, how they use the library for information and how effective they find it. Furthermore, he usually has no idea why a particular item of information is requested or its ultimate use, purpose and importance. Here, of course, he is at a disadvantage compared with colleagues in special libraries.

The possible market for library service is enormous. There are about 100,000 manufacturing firms, not to mention 500,000 active companies or 2 million business enterprises. None of these is more than a mile or two from the nearest public library service point and only a very small proportion indeed have the staff, the resources or the 'know-how' to provide their own organized information service. Some quite small firms such as advertising agencies, market researchers or export merchants are avid consumers of information compared with some large factories which might have their 'brains' at remote head offices. Paradoxically, I find that those organizations with the highest developed information centres and libraries tend to be the biggest users of the public library (some 50 per cent of our users claim to have a useful library at work).

It is misleading, however, to talk about 'firms', 'enterprises' and 'companies'. I cannot emphasize too strongly that it is *people* who use a library. The only time I come into contact with the legal concept called a company is in correspondence. This paper is primarily concerned with people who use a public library for purposes of their employment which, to quote the Aslib Survey is 49 per cent of personal visitors and 86 per cent of telephone inquirers.

One of the notable findings of the Bolton Committee[3] is that when a small firm needs help, the sources most likely to be called upon are local and familiar. Most of us are creatures of habit who tend to give preference to a place we know well. When asked in the Aslib Survey why they chose to use the Library, respondents gave answers like 'I have known it all my life', 'I see it every day' or 'I have always used it'. People do not want to go far for their information and paying staff to travel long distances to obtain information is uneconomic. Work locations within ten miles of the Library make up 86 per cent of our use and a radius of a further ten miles, although admittedly much less densely populated, brings in only another 7 per cent. Geographical proximity is not the only advantage of a local service. A public library builds up its stock according to day-to-day expressed demand which results in its service being particularly sensitive to local requirements. Public libraries, therefore, differ in their emphasis and specializations and it is no surprise to find, for example, that Sheffield specializes in information on steel, London on printing and finance and that Glasgow is the only library which keeps an alphabetical index of Scottish registered companies.

Probably one of the most important aspects of the local provision of libraries is the facility for browsing. A small clothing manufacturer may be primarily interested in Continental fashion magazines but he will also readily browse through periodicals on advertising, packaging, management, accountancy and taxation. It is most unlikely he will ever require a specific periodical article or ever call upon the services of Boston Spa. A special type of browsing is concerned with company information where sometimes quite small straws in the wind are important. This is an area which often involves a high degree of confidentiality and the searcher does not wish to enlist the help of the staff.

One senior information officer of an international engineering group who is a regular user of the Library told me recently that the purpose of his browsing was 'to extend his directors' thinking along certain lines or on particular subjects—any new ideas are assessed against internal company information for medium- or long-term planning'. Perhaps in their anxiety to promote their abilities in the retrieval of information, librarians do not accord sufficient importance to the catalytic effect of browsing on creative thinking.

However, the majority of people in business are not concerned with the creative task of formulating questions but rather with the more mundane job of answering them. Most public libraries provide specific factual information not only to callers in person but also by 'phone, letter and often telex. Whilst they cannot always come up with the complete answer, possibly only available from some distant source, they can usually supply sufficient information for a decision when time is important. There is a twenty-four hours dead-line for more than three-quarters of telephone inquirers and for almost a third of visitors.

The special departments of public libraries anticipate inquiries by maintaining extensive files of newspaper and periodical clippings, information indexes and indexes to special kinds of material such as company registrations, trade names, trade catalogues, electoral registers and statistics. Their stock includes much material marginal to company library collections or which a firm is unlikely to buy for itself. A hundred firms might each require to use a Philippines directory once but no single firm is going to purchase a copy. Overseas financial manuals are probably required more often but their cost is likely to deter all but the most affluent company libraries. As well as many hundreds of thousands of books, a public library may have collections of patents, official publications, statistics, dictionaries, newspapers, periodicals, prints, maps, company reports, standards and trade catalogues all organized to be quickly available for providing information. The type and level of information supplied is indicated in tables 2, 3 and 4, 'employer group', 'job of user' and 'areas of interest' in the Aslib Survey. The latter include companies (34 per cent), marketing (22 per cent), timetables, gazetteers, electoral registers, etc. (16 per cent), products (15 per cent) and statistics (11 per cent).

When a public library cannot supply information from its own resources, the inquirer usually wants to know from where it can be obtained and how much it is likely to cost. The alternative sources are usually a bank, a solicitor, an accountant, a stockbroker, a market research agency or a company information service. Often enough, the information requested does not exist at all. Public libraries, of course, act as filters for national libraries and when, for example, it is not possible to satisfy a statistical inquiry from our own collection, the inquirer is usually passed on to the DTI Statistics and Market Intelligence Library or provided with the extension number of a particular government statistical office. It must be emphasized, however, that in many subject fields such as company and investment information, national libraries have no greater resources than some public libraries.

Even in purely quantitative terms, it is not easy to establish the success rate of an information service. A library taking filtered questions may expect a lower degree of success than one taking first attempt questions. People who have not had a satisfactory answer may be less likely to complete a questionnaire about the service received. Compared with a lending library, the rate of response to a surge of public demand is much less flexible and we have a fairly rigid maximum of dealing with about 150 inquiries a day from users in person plus 100 telephone inquiries. The Aslib Survey does not include any telephone inquirers who rang off before we were able to attend to them. Bearing these facts in mind, 71 per cent of users expressed satisfaction including a happy 11 per cent who actually received more information than they expected; a quarter received only a partial answer or no answer at all to their inquiries. What proportion of this quarter represents unanswerable questions (at least as far as a library is concerned), what represents deficiencies in stock and what represents staff inability, I can only guess.

An obvious service provided by a public library is the loan of material, although there are limits to this. I have been asked, for example, for the loan of our current set of Moody's American Company Manuals and for all our current information on Pakistan. To minimize borrowing (both official and non-official) of certain kinds of material, public libraries run immediate photocopying services and the larger libraries have photographic departments with a technical staff providing a wide range of facilities.

Many libraries, e.g. London Business, Sheffield, Coventry and Southampton, produce reading lists, guides and bibliographies aimed at the commercial and industrial user. Oldham has published a three-part checklist of local companies which includes a unique alphabetical list of mills showing their present occupants.[4] Some of these publications are issued in connection with a local co-operative scheme. Although most of these schemes were based on the interlending of periodicals and the compilation of a union-list, the development of the British Library would appear to be making this original role secondary to the advancement of a closer relationship between all those responsible for libraries and information units in a particular area. The linchpin of co-operative schemes is usually the public librarian and a good working and social relationship between him and the company librarian is most advantageous if only because the personally known inquirer has an advantage over the anonymous one. As part of his training, if each member of staff of a special library could work in the public commercial or technical library even for a day or two, the knowledge gained of its resources would pay dividends. With this in mind, some public libraries have run practical courses on specific subjects such as European companies and European statistics aimed at the staffs of local special libraries. The public library stock can be useful in book selection to check on items that have been overlooked or to see if that new management periodical, German dictionary or American directory is worth buying. There is, too, a wide selection of bibliographical tools—national and subject bibliographies, printed catalogues, newspaper and periodical indexing and abstracting services, and lists of official publications. For the company librarian–information officer who is professionally on his own at his place of work, the public commercial or technical librarian can provide a sympathetic second opinion in difficult inquiries and projects. In dealing with members of firms, the public librarian can be faced with some diplomatic problems. In certain companies, the information officer appears to be regarded by the sales, financial and management staff as being solely concerned with scientific and technical research. Obviously, I would prefer to deal with only one person in each firm and we have a strict rule that no matter who approaches us, material is only lent through the firm's librarian. To be frank, we are more concerned about the safe return of borrowed items than the status of the librarian. What is intolerable, of course, is when someone in a firm puts his inquiry to his own library and the public library simultaneously so that they are both, unknown to each other, put in a competitive position.

Finally, what is going to be the effect of the coming reorganization of local government. As far as the present more advanced services to industry and commerce are concerned, I regard their future with little optimism. A striking feature to emerge from the Aslib Survey is the strong demand for an efficient telephone inquiry service. Not only is this kind of service highly labour-intensive and therefore expensive, but it needs staff of the calibre which is difficult to retain in a public library. In many local authorities there is now so much emphasis on 'management' that, inevitably, professional expertise is down-valued and career prospects for specialist information work compares increasingly unfavourably with that in academic and government libraries. With the present fast expansion of business and economic information, it does not seem possible for public libraries to be able to afford many of the new sophisticated financial and company services now available. Moreover, as so much of the stock of a commercial library is purchased from overseas, the declining value of sterling has made deep inroads into the book fund (compare the present cost of German directories with three years ago). The large city libraries are unlikely to improve their financial position because, in the main, they will become the responsibility of Metropolitan Districts and will be unable to draw on the much wider financial resources of the Metropolitan Counties. Less than 40 per cent of my own library's users live in the area of the new District yet the service provided covers the whole Metropolitan County area. A recent DES paper[5] suggests that some of the facilities might be provided on a subscription basis with contributions from the other constituent Metropolitan Districts but I do not believe this to be in the realm of practical politics. In the non-Metropolitan Counties, where the counties are the library authorities, the outlook is much brighter and there is a probability of specialist services being developed in greater depth in the next ten or twenty years. However, it seems improbable that really effective business information services can be evolved anywhere but in centres of large concentrated populations. One further cause for concern results from the present streamlining of local government. This places public libraries under the control of committees with wider responsibilities and with designations like 'Leisure', 'Cultural' or 'Recreational'—terms which in themselves do not appear compatible with service to industry and commerce. There is a possibility that this kind of service may be considered peripheral to the main objectives of the new committees and thus given lower priority than some minority cultural interests or administrative side-shows. To summarize, public library services to industry and commerce are likely to improve both in number and quality but some of today's leaders may well find themselves overtaken by new, richer and larger authorities.

REFERENCES

1 CLEMENTS, D. W. G. Use made of public reference libraries. *Jnl of Documentation*, **23**, June 1967, 131–45.

2 OSBORN, A. *Report on a pilot study at the Commercial Library, Manchester Central Library, concerning the use and users of publicly available business and commercial information.* Aslib Research Department, 1973.

3 *Report of the Committee of Inquiry on Small Firms.* Cmnd. 4811, HMSO, 1971.

4 *Oldham Public Libraries. Checklist of Oldham Companies.* 1972.

5 Department of Education and Science. *The public library service: reorganization and after.* HMSO, 1973.

USE OF A PUBLIC LIBRARY COMMERCIAL DEPARTMENT

TABLE 1: *Location of respondents' workplaces*

		METHOD OF CONTACT	
	Total	*Personal visit*	*Phone call*
Total	482	407 (84%)	75 (16%)
WORK LOCATION			
City of Manchester	305 63%	274 67%	31 41%
Within ten miles	112 23%	81 20%	31 41%
From ten to twenty miles	32 7%	24 6%	8 11%
Elsewhere in the UK	30 6%	25 6%	5 7%
Abroad	3 1%	3 1%	0 —

TABLE 2: *Type of contact by employer group*

	Total	*Personal visit*	*Phone call*
Total	566	488 (86%)	78 (14%)
EMPLOYER GROUP			
Manufacturing industry	102 18%	69 14%	33 42%
Transport/Communications	28 5%	24 5%	4 5%
Distributive trades	43 8%	36 7%	7 9%
Financial	58 10%	50 10%	8 10%
Services	110 19%	97 20%	13 17%
Government	53 9%	52 11%	1 1%
Education	42 7%	38 8%	4 5%
Other	20 4%	16 3%	4 5%
None	113 20%	109 22%	4 5%

TABLE 3: *Type of contact by job of user*

		METHOD OF CONTACT	
	Total	*Personal visit*	*Phone call*
Total	566	488 (86%)	78 (14%)
JOB TITLE			
Administrative/Manager	89 16%	74 15%	15 19%
Clerical/Secretarial	60 11%	40 8%	20 26%
Sales	72 13%	63 13%	9 12%
Professional	208 37%	181 37%	27 35%
Student	65 11%	65 13%	0 —
Other, including Retired	74 13%	67 14%	7 9%

TABLE 4: *Type of contact by areas of interest*

Total	566	488 (86%)	78 (14%)
AREAS OF INTEREST			
Product information	87 15%	75 15%	12 15%
Market information	125 22%	118 24%	7 9%
Management information	4 8%	36 7%	8 10%
Import/Export information	45 8%	35 7%	10 13%
Companies information	195 34%	155 32%	40 51%
Statistics	61 11%	54 11%	7 9%
Maps	32 6%	32 7%	0 —
Timetables, etc.	90 16%	74 15%	16 21%
Other	74 13%	69 14%	5 6%

TABLE 5: *Type of contact by previous attempts to find the information*

		METHOD OF CONTACT	
	Total	*Personal visit*	*Phone call*
Total respondents	566	488 (86%)	78 (14%)
PREVIOUS TRIES			
Nowhere, first attempt	345 61%	325 67%	20 26%
Library or other organization	93 16%	71 15%	22 28%
Notes, files at work	95 17%	59 12%	36 46%
Asking colleagues	75 13%	61 13%	14 18%

TABLE 6: *Type of contact by other services available*

Total respondents	566	488 (86%)	78 (14%)
USE OF OTHER SERVICES			
Those with useful library at work	285 50%	235 48%	50 64%
Those using other public services	166 29%	135 28%	31 40%
Those with access to useful membership organization library	247 44%	210 43%	37 47%
Those with none of the above	174 31%	157 32%	17 22%

TABLE 7: *Type of contact by urgency of need*

Total	566	488 (86%)	78 (14%)
URGENCY OF NEED			
Today/tomorrow	202 36%	142 29%	60 77%
Within a week	150 27%	140 29%	10 13%
Within a longer period or with no time limit	196 35%	189 39%	7 9%
No answer/didn't know	18 3%	17 4%	1 1%

TABLE 8: *Type of contact by reason, work related or personal*

		METHOD OF CONTACT	
	Total	Personal visit	Phone call
Total	562	484 (86%)	78 (14%)
REASON FOR CONTACT			
Work related	304 54%	237 49%	67 86%
Personal	258 46%	247 51%	11 14%

TABLE 9: *Type of contact by person needing the information*

Total	560	482 (86%)	78 (14%)
WHO NEEDED INFORMATION?			
User him/herself	490 88%	438 91%	52 67%
Someone else	70 12%	44 9%	26 33%

TABLE 10: *Type of contact by satisfaction with outcome*

Total	566	488 (86%)	78 (14%)
SATISFACTION WITH RESULT			
Yes, bonus or sufficient	404 71%	339 69%	65 83%
No, partial answer or nothing	140 25%	127 26%	13 17%
No answer given	22 4%	22 4%	—

These tables are extracted from, Averil Osborn, *Report on a pilot study at the Commercial Library, Manchester Central Library, concerning the use and users of publicly available business and commercial information.* 89 pp. Aslib Research Department, March 1973.

Information for Members of Parliament: the service provided by the House of Commons Library

David Menhennet

House of Commons Library

Paper presented at the 47th Aslib Annual Conference, University of Bath, 23rd–26th September 1973

A. Introduction

'INFORMATION TRANSFER' may be considered at different levels of sophistication. The subject goes much wider and deeper than, for example, the physical movement of library materials from one location to another. It is wise for us to remember, however, that behind all our discussions at this Conference, and behind the massive apparatus of the Congressional Research Service in Washington and of the National Diet Library in Tokyo, lies one simply expressed requirement: that of providing the right person or organization with the right information in the right manner at the right time. The most carefully organized information retrieval systems are sometimes defeated by elementary slips or misunderstandings on the part of those who operate them. From this introduction you will have deduced that I am a firm believer in the overriding human values of common sense, intelligence and attentiveness to the matter in hand—whatever the question and whatever the circumstances.

B. Information management

There is no shortage of information. Rather, the abominable perils of the 'information sink'—failure to exploit available knowledge through one's inability to organize and tap it effectively—are well known to us all. A scholarly study of the waste-paper baskets in the House of Commons Library would reveal, I am sure, how much unsolicited and, for different reasons, irrelevant literature reaches Members of Parliament. In an article in the *Library Association Record* in April of this year, Mr Kenneth Lomas, MP, summed up the busy Member's dilemma when he declared:

> I suppose any MP's instinctive reaction to the word 'library' is that he wants to read less, not more, and that he already spends quite enough of his time numbly trying to master Parliamentary Papers and other essential material....

In other words, the Member of Parliament lacks time; and the problem, for those whose job it is to provide him with information, is one of information management. This is not a new problem at Westminster. In March 1835, the then Librarian of the House of Commons, Thomas Vardon, was asked to explain his duties to an important Select Committee, chaired by the Speaker. He said (my italics):

> . . . it amounts in fact to this, that to the extent of time which I can give, which is day and night during the sitting of the House, the practice is, that there is no subject connected with parliamentary business . . . on which I am not called upon to afford *instant information*. In respect to Select Committees, the notes continually sent to me . . . do not specify 'I want such and such a volume of such a work', but . . . contain generally queries whether there be law upon such and such a subject . . . or regarding parliamentary papers, whether such information can be given, and whether, *without troubling the Members with long papers*, I can state briefly the information desired in their queries. . . .

Prophetic words! More than a century later, in 1945–46, another Select Committee redefined the terms of reference of the House of Commons Library as being 'to provide Members rapidly with precise and detailed information' on all subjects connected with their duties. Since 1946 this active role of handling, interpreting and disseminating information to the House of Commons, and to its 630 individual Members, has determined the basic philosophy as well as the organization, recruitment policy and holdings of the Library. Today, the latter is a Department of the House, with 63 staff and a current annual budget of £210,000, most of which is spent on staff salaries. However, before outlining the work of the Library's two Divisions—namely, the Parliamentary Division, or General Library, and the Research Division—I should like to place the Library in its environmental perspective by referring to the special requirements of its users in the field of information.

C. Information services: Members' special requirements

Whether his party is in or out of office, the Member of Parliament is an important public figure. Almost without exception today, MPs are busy to the point of overwork and, in their information requirements *vis-à-vis* the Commons Library, they share at least five common characteristics: speed, accuracy, up-to-dateness, political objectivity and selectivity of response. To which I would add (inevitably, in view of the nature of public life) unpredictability of demand. Taken separately, the above characteristics are not, of course, confined to parliamentary information services; but their combination probably is, to say the least, a highly distinctive feature of the latter's work.

Speed of response needs little elaboration from me this morning, except to say that since 1946 consistent demands have been made on the Library, by Members of Parliament, for quick-response information services. Our Research Division, which handles the so-called 'longer-term' enquiries (often quite complex and difficult enquiries), functions on the assumption that about two-thirds of its written answers will be required within forty-eight hours. As for the non-research enquiries, a member of the staff who is given twenty minutes to establish the statutory provisions governing noise in public places, the mooring rights of fishermen at Southend-on-Sea, or the current regulations affecting milk marketing in the European Communities can count himself or herself reasonably lucky.

Accuracy is a ubiquitous condition of information transfer. It is fair to say, however, that Members of Parliament are exceptionally well placed to make effective, sometimes nationally decisive, use of the facts and figures placed at their disposal, so that mistakes on the part of Library staff—fortunately these mistakes are rare!—can be costly and embarrassing.

Up-to-dateness is absolutely essential in the context of parliamentary life, where so often what is topical and correct today is past history the next day. When asked for the latest Government statement on (say) inflation, it is not enough to identify the most recent White Paper or reference in *Hansard*: Library staff must also check the text of, for example, the previous evening's Guildhall speech by the Prime Minister to ensure that a more up-to-date statement is not available. The Library possesses some 125,000 bound volumes and maintains good author and alphabetical subject card catalogues; it also operates a book-lending service for Members. But books, because they are so seldom up-to-the-minute in their content, are less central to the Library's informational organization than are its massive current intake of official records and papers—British, European Communities and international—its newspapers, periodicals and press cuttings services, its special collections of Government circulars, press notices, broadcast scripts, pressure group literature, etc. (I hope that it will not be too long before we can add, *inter alia*, broadcast tapes and video-recordings to the above range of essential materials.) On most of this material we need to keep a firm, day-to-day bibliographic grip: and this is achieved principally by means of various visible strip indexes, specially compiled for internal Library use from 1955 onwards. Time does not allow me to describe these indexes now, but I should be happy to discuss them afterwards.

By political objectivity I mean, quite simply, that Library staff present the information asked for without personal or political advocacy of any kind. I do *not* mean that we decline to answer questions such as:

1. What arguments are most commonly advanced in this country against the development of supersonic air transport?

or:

2. Provide a critical comparison of the respective chemical breakdowns of the average United Kingdom imported barrel of oil, and of the average barrel of North Sea oil.

Finally: selectivity of response. Most of the 2,500 enquiries which Members lodge with our Research Division staff within an average session are made in relation to one or more particular aspects of public policy. They are not academic questions, posed in the abstract. Members of Parliament asking these questions have either usually decided on their view of a certain policy issue, or are in the process of coming to a decision about it. To take an obvious case—when Parliament was considering the fundamental issue of whether this country should join the European Communities, each individual Member was required to come to a personal decision 'for or against'. Now, any piece of information asked for in the context of the Common Market debates would almost certainly have been sought in order to help an individual Member make up his mind, or to confirm him in his opinions, or to help him oppose a different point of view. To provide him with the maximum informational assistance, a *selective* 'in-context' reply would have been required on the part of the Library staff.

Two questions recently asked of the Scientific Section of the Research Division further illustrate the point. Is the food industry poisoning us with cyclamates, saccharin and certain other additives? Secondly, what is the significance of the appearance, for the first time in this country, of photochemical smog? Not only must the researcher handling these and other similar enquiries select the most relevant material; he must evaluate his sources, both published and oral, in a qualitative sense, and he must put together widely scattered data to form what often falls not far short of an original piece of research. Similarly, our statistical staff collate figures from a variety of sources, do calculations on them, annotate them on conceptual points and generally adapt them to a Member's specific requirements. In the nature of things, a larger proportion of the quick-reference enquiries dealt with in the Parliamentary Division, or General Library, come closer to being purely factual; nevertheless few such questions are asked without reference to a public policy issue or to a Member's special interests and, ideally, the information provided should be tailored to the context of the particular enquiry.

Selectivity of response goes hand-in-hand, of course, with political objectivity. It would be quite wrong for Library staff, in pushing totality out of the front door, to allow bias to creep in by the back door!

D. The Research Division

The Research Division forms an integral part of the House of Commons Library and today its staff of 22 are organized, under the supervision of one of our two Assistant Librarians, in four 'specialist' sections: Economic Affairs, Statistics, Home and Parliamentary Affairs and the Scientific Section. The 16 senior staff are mostly graduate subject specialists each handling, within his or her section, particular areas of public policy research such as higher education, housing, agriculture, immigration, industrial training and so on. However, there are also a small number of professionally qualified library staff in the Division; the latter help with some of the research, but are concerned primarily with the vital matters of the intake, processing and arrangement of the Division's considerable material resources.

A glance at an average day's research output will give a fair, if somewhat superficial idea of the range of work undertaken. During such an average day while Parliament was in session typed answers might be despatched on the following subjects by different members of the Research Division:

1. The mechanics of international tax avoidance.
2. Estimates of future Arab revenues from oil, and the effect of Arab financial reserves on the world monetary situation.
3. The parliamentary history of euthanasia.
4. An outline of the principles governing compensation to private owners for compulsory purchase by a local authority.
5. The nature and the availability of supplementary benefits for deserted wives.
6. Certain aspects of the legal system in Jersey.
7. A list of innovations in veterinary medicine since the 1876 Cruelty to Animals Act.

8. A 'complete brief' on the manufacture and marketing of caravans in Britain.

To answer these questions, research staff will draw on the material resources and indexing aids of the Library as a whole (which are organized to help them as much as is reasonably possible), as well as on their own special collections of indexed material and the confidential registers of previous research work performed. They will also, in many cases, consult sources outside the Library: in London, Glasgow, Manchester, Boston Spa, etc., and, if there is time, in Brussels, Luxembourg, Paris, Bonn or even Washington: using the telephone, telex facilities, telegram or diplomatic bag in order to obtain maximum value in terms of relevant information. One day, staff will no doubt be using computer data links to access external information sources. Great importance is attached to getting the question right: we use fairly elaborate research enquiry forms and, whenever possible, we encourage the Member to discuss his question—to sharpen the focus of his enquiry—with the researcher who will try to answer it. In this way a generalized request for 'some background notes on Value Added Tax' can be transformed into a more effectively answerable enquiry on the current rates and coverage of the tax, in France and Germany, as compared with those in the United Kingdom and Ireland respectively. It is easy to transfer information. It is much more difficult, and rewarding, to transfer the right information.

Up to now I have been speaking of information supplied in answer to specific, individual requests from Members. These services constitute by far the greater part of the Library's work and in my opinion they are what the Library does best. However, the staff of the Research Division also prepare on a voluntary basis, for the House and for Members generally, several series of bibliographies and other papers in anticipation of the Second Reading of an important Public Bill, or in the context of a matter of current major parliamentary concern such as the Maplin Airport and the Channel Tunnel proposals. I will mention only two of these general services now.

Reference Sheets are highly selective, annotated reading lists, geared strictly in content and in arrangement to the likely priorities of busy Members, and each list is accompanied by a specially compiled box, or file, of the material to which it refers. About 30 of these—on subjects such as the Reform of the International Monetary System, the Steel Industry and the Televising of Parliament—are compiled each session, and copies are freely available to Members in the main suite of library rooms.

Background Papers are factual, though analytical, briefs compiled by subject specialists. These papers go beyond the bibliographical role of the Reference Sheet; they take longer to compile, and are becoming increasingly popular with Members. Recent papers have included studies of Worker Participation in Industry, Murder Statistics and Private Members' legislation in Parliament.

E. The Parliamentary Division

I have left myself with little time to describe the work of the Parliamentary Division, or General Library: in the context of the present Aslib Conference, this work consists in the provision of published material—British, international and foreign—of all kinds, and in comprehensive quick-reference services. As regards published material, the ease with which relevant extracts of texts can be photocopied, and the copies then taken away, has greatly increased the usefulness of such material for Members. Approximately 1,000 quick-reference enquiries are handled during the course of the average sitting week. Requests arrive by letter, by telephone (there are nine telephones at the three main enquiry points), or are made personally in the Library by Members. The Library is splendidly situated to provide such an information service, being only one minute's walk from the Chamber! Finally, I should mention that the Library's expanding International Affairs Section, which includes the European Communities Desk, forms a part of the Parliamentary Division, although its staff carry out a certain amount of written *research* for Members and prepare Reference Sheets and Background Papers when necessary.

F. Microforms and SDI services: A few comments

May I now briefly touch on two different aspects of information transfer? These are, respectively, the use of microforms and the provision of a Selective Dissemination of Information service. The advantages of storing information in microform are obvious. However, bearing in mind that legislative libraries have to identify and retrieve material exceptionally fast, and the fact that a Member of Parliament will want that information, once retrieved, to be made available to him in a convenient, take-away form, I believe that it would still be premature for the Commons Library to rush into the extensive use of microfilm or microfiches for current source materials. A personal opinion which is shared by staff in at least two other important legislative libraries! The Library's three-month experimental, computerized SDI service in 1968 is past history now. This experiment was followed in 1970 by a twelve-month feasibility study carried out by a team from Aslib, the result being a 270-page report on 'Computer support for parliamentary information service'. That report remains a most thorough and constructive assessment of the situation, although cost and other factors have ruled out its implementation for the present. An up-to-date account of the Library's present position on computer applications is given in an article by my colleague Dr John Poole, in the October 1973 issue of *The Parliamentarian*. The advantage of a computerized SDI service is that it makes possible the regular updating of relevant information This was much appreciated by certain Members in 1968. Its principal drawbacks are that it can generate a great deal of paper, and usually provides a fair amount of references which—however well the recipient may have been profiled—are not directly relevant to the latter's current information needs at a given time. For this reason, the Aslib Report of 1971 rightly looked ahead to the provision, via visual display units in the Library, of direct access to information stored in a computer. In its present, short-term experiments with ICL and IBM, the Library is bearing this point in mind.

G. International perspective

In January of this year I took part in a symposium in Geneva, organized by the

Inter-Parliamentary Union, on 'The Member of Parliament: his requirements for information in the modern world'. Parliamentarians, their staff and academics from over 30 countries—ranging from Australia to the Republic of Zaire, from Brazil and Chile to Mongolia and Kuwait, from Russia to the United States—took part; and I think that, had I presented then the paper which I am reading today, I would have found myself in substantial agreement with most of my colleagues at that Conference There were some interesting exceptions. Certain one-party states maintained, through their representatives, that there was no parliamentary 'information problem' in their country, since the officially available facts and figures were wholly adequate and reliable in themselves. It was also pointed out that in many of the smaller, less developed countries, where effective information services for parliamentarians were most sorely needed, there were simply not enough financial or trained intellectual resources available to establish the necessary facilities.

Generally, however, the situation was summed up and agreed as follows:

1. In most developed countries, the Member of Parliament is in danger of being over-informed. His absorptive capacity is severely strained. The significant question is: are MPs being efficiently and well informed?
2. A Member's sources of information are many and varied. However, the important role of the legislative reference service (LRS), or working parliamentary library, is now widely accepted.
3. As one of the Indian delegates (Dr Kashyap) put it:

> . . . the LRS approach to retrieval, analysis, organization and dissemination of information has to be specifically orientated to achieving its distinct objective of tackling the information problem of modern parliamentarians. Since present-day legislators are proverbially hard-pressed for time, information has to be supplied to them, if possible, at their doorsteps—almost through the taps—and when they need it. It must be pre-cooked and in easily digestible and immediately usable form. It is of supreme importance that what the LRS supplies are not comprehensive compendia, incomprehensible statistical data-sheets or scholarly monographs, but information concentrates in a sort of pill form.

I will end on the above practical and international note sounded by Dr Kashyap in Geneva earlier this year: except that I should like to make one final, more domestic reference. In their detailed study of *The Member of Parliament and His Information* (Allen & Unwin, 1970), Anthony Barker and Michael Rush record that the term 'parliamentary information services' is 95 per cent synonymous, at Westminster, with the work of the Commons Library. That is an encouraging statement. I, for one, would begin to be really worried only if and when the exacting but fascinating task of providing information services to the House of Commons were to cease to be the Library's central responsibility.

Information services for the universities

Susan M. Evans

British Library Lending Division, Boston Spa

Paper presented at the 47th Aslib Annual Conference, University of Bath, 23rd–26th September 1973

I FEEL obliged to begin by apologizing for my lack of current involvement in that sphere of activity—the university world—which I am to discuss. I have, however, provided information services in two universities in the recent past and have seen many others in operation, and now believe that my position of comparative detachment at Boston Spa is in fact an advantage in as much as it aids a clearer view of the many and often complex problems which beset the provision of information services to universities.

First of all, I should like to point out that the information services which are directed at the university can spring from either external or internal sources. With regard to external sources, members may subscribe to commercial services or seek information from a source geared to a particular profession. In speaking here of a 'profession', I am not necessarily referring to that of a university lecturer. We must remember that the university lecturer lectures *in* something and that 'something' often gives him another professional orientation, especially where the subject involved is vocational—for instance, Town and Country Planning or Hotel and Catering Management. I am sure I do not need to remind you, however, that external sources of information are not always—in fact, not usually—formal. Often they take the form of the 'old-boy network', which, if well-developed, may dupe its participants into believing that their information needs are being met, so that they resist information from perhaps more reliable sources.

Where services are provided from external sources, the university library can, but does not always, act as intermediary. For example, the use of the computer-based services such as ESRO/ELDO, INSPEC, MEDLARS and UKCIS have always been largely independent of the library and, anyway, has never been particularly widespread for a variety of reasons, but especially since the introduction of charges. Some university libraries—Aston, Bath, Bradford, Cardiff and Sheffield are examples—have produced pamphlets describing the services available. Assistance is occasionally given in the compilation of profiles, but, on the whole, it is shortage of time, and, regrettably, sometimes lack of knowledge of the services available which prevent the university science librarian from undertaking the work of a liaison scientist.

In the case of sources of information internal to the institution, the university library is far from being the only supplier. I am not thinking here just of informal networks within the university, nor simply of information services based on departmental libraries, with varying degrees of overall control, but of departmental information services completely independent of the library. There are signs that these are on the increase, and this trend is generally resisted by the university libraries. The reason for the resistance is not simply megalomania—at least, not always! A scattering around the campus of unco-ordinated information points would inevitably be inefficient. But this tendency will increase unless libraries recognize the need for information services, meet this need and, in so doing, overcome the resistance to library-based services which I shall mention again at a later stage in the paper.

University libraries have, however, been slow to accept the information service function, the decision makers in only a handful of them regarding it as a necessity and the rest as an expensive luxury, with a puritanical hard core of the latter therefore zealously opposing it as a positive evil. On the whole it has been the newer universities, especially the technological ones, which have led the field. Some of the arguments against information services could be, and probably have been, heard in libraries in entirely different environments. For example, it is sometimes maintained that information services would increase demands on the already overstretched resources of the library, so that extra staff would be needed when the money would be better spent on books. But other arguments hinge on the special nature of the university context and, in particular the 'spoon-feeding is bad for you' line takes on a special force in the academic world where it is widely maintained that information searching, whether it be part of the learning, teaching or research process, is an integral part of the scholastic task, a position usually held on definitional or pseudomoral grounds rather than on functional ones. It is, of course, the case that the process of searching can change perspectives and broaden horizons as well as provide information, but the possibility of this by-product does not justify the expenditure of the time and energy of a busy teacher–researcher when the task could be done more efficiently by someone else, especially when, as now, pressures on such people's time are increasing as the volume of literature grows, and when also the tools available are growing in number and complexity so that all but the most dedicated and gifted of users will find it increasingly difficult to decide which tools to use and how best to use them. Ultimately, the position is best summed up by one of the recipients of the OSTI-supported Experimental Information Service in the Social Sciences,[1] which was carried out at the University of Bath and with which I was involved, who remarked: 'The university is a knowledge industry: any technique that makes knowledge more available is welcome.'

Those university libraries which have responded to the challenge of meeting the information need have reacted in different ways. Whilst some, such as the City and Surrey, set up an information department—with subject specialism usually evolving but not being an essential attribute of the system at its inception—in other libraries, Lancaster and Bath being examples, information functions have been assumed gradually by subject specialist librarians shedding more routine responsibilities, and elsewhere, as at Sheffield, one or sometimes two information officers have been appointed to cover the whole field. In the last type of case there will obviously be little time for anything beyond the most rudimentary current awareness activities (perhaps the distribution of photocopies of the contents pages of relevant journals) and retrospective searches will be restricted severely in number and duration. The information staff will probably concentrate on instructing students in the use of information sources, on producing handouts about these sources and about other matters relevant to information searching, on giving *ad hoc* assistance with information problems, and perhaps on obtaining translations. Such a level of service—and, in fact, a higher one—may well be provided by individuals not designated as 'information officers'. At Sussex, for example, these functions are carried out by 'readers' advisers'. This is an area, however, in which disagreements over nomenclature are far from being idle, in that designation may well influence the crucial issue of acceptability to the client.

I want to conclude this very sketchy picture of the types of services provided by pointing out that very few of them, even in the most enlightened institutions, approach the level of service offered in some government and industrial research establishments, and by bringing to your attention the fact that in some university libraries where there are objections to the information service function at the top of the hierarchy, such services are provided clandestinely by dissident members of staff. I personally know of one individual working in a Scottish university, which for obvious reasons must remain nameless, who is providing an excellent 'undercover' service of this kind.

Whatever the type or depth of service, in most cases users in the social sciences and humanities tend to receive a raw deal. This is perhaps because the argument against information services in general can be made to look more plausible if it is narrowed to these areas where, or so it may appear at first sight, the problems of providing a service are greater, the need less and the value more uncertain. In regard to the problem of providing a service I am thinking particularly of the general inadequacy of the published tools available—largely, though not totally, the result of the inherent nature of these subjects and of their terminology. But, on the other hand, the problems of searching for information in the non-scientific fields make it all the more essential that those trained in this skill be employed upon it, tracing material which may be available in a number of forms and from a number of sources. Turning to the question of need, it has been maintained that in the social sciences and humanities there is less call for factual information or up-to-dateness and less need for the exhaustive literature search, partly because of the smaller fear of duplication and also because fewer items are of crucial importance. With regard to the social sciences, this sort of position must now be virtually untenable in the light of recent empirical evidence—in particular, the work of the Investigation into Information Requirements of the Social Sciences,[2] which took place at Bath and from which the experimental information service which I mentioned earlier drew some of its origins. One of the conclusions of INFROSS was that many social scientists do have unsatisfied information needs because of shortage of time, difficulty in retrieving information known to exist and ignorance of the existence of information that would be of value to research. The position with the humanities remains to be investigated in similar fashion, but there is evidence to suggest that if services were introduced, a reservoir of latent demand would be revealed.

As to the comparative value of information services in the different fields, since no valid and reliable measure exists, it can neither be proved nor disproved that the value is less in the non-scientific field. I do not want to dwell on the matter of the value of a service, nor on cost–benefit analysis and the problems of applying it to the university context, but I would like to point out that the value of a service is ultimately no more and no less than that which the university cares, or can be persuaded, to put on it, and what matters are practicalities such as that at the conclusion of the Bath service, the two professors most closely involved were willing to give up some of their own meagre departmental funds to ensure its continuance In fact, in the follow-up survey to the Bath experiment, 5 of the 41 individuals involved announced their willingness to support the continuance of such a service out of their own pockets This may seem a pathetically small proportion, but it must be remembered that in the university world it is part of the prevailing mores that the tools of the trade be supplied at the institution's expense.

In the last part of this paper I want to touch on some of the practical problems of providing an information service in the university and, in particular, I want to discuss who should give the service, to whom it should be directed, from where it should be provided, and of exactly what it should consist.

On the matter of who should provide the service, the most discussed question is that of whether subject specialism is necessary. There is no doubt that some formal education in a client's subject can help overcome the confidence gap, but it is always going to be difficult to find the right number of subject specialists in the right subjects, and one of the conclusions of the Bath experiment, in which the service was provided first by a subject specialist with no library qualifications and then by a qualified librarian with a much scantier subject knowledge, was that beyond a minimum level, bibliographical skills provide better results. But it was also our opinion that given a modicum of both, personality and the motivation to serve are probably more important than either.

The problem of to whom services should be provided is one of allocation amongst undergraduates, postgraduates, researchers, teachers, administrators and so on. The in-depth service provided during the Bath experiment necessitated, it was estimated, an information officer/client ratio of about 1 to 30. Given present and possible future levels of resources, it is obviously the case that such a service could not be provided across the board even in the smallest universities of, say, 5,000 total population. There are good reasons for restricting the higher level of service—that is, one that involves formal current awareness and anything more than the most limited retrospective searches—to members of staff. In theory, the benefits staff derive from the service in terms of, for example, time saved and greater coverage of the literature, will be passed on to the students they teach and supervise. Moreover, whereas it seems to me to be sensible to argue that, as far as staff are concerned, literature searching is a separate skill best done by someone specifically trained in that skill, as far as students are concerned, learning to search the literature of their subjects is part of learning about the subject itself. But flexibility is the keyword here—there can be times when it is more efficient for the information officer to search the literature for the undergraduate, other circumstances in which it would be more efficient for the member of staff to do this for himself (ideally, being able to do so as a result of a continuous 'learning-by-doing' process supervised by the information officer) and yet others in which the task could best be completed by a compromise—perhaps by the researcher concentrating on core items and the information officer scanning the fringes for more than one client at once, which is a *modus operandi* adopted, for example, by the information officers at the City University.

A further aspect of the allocation problem is that the 1 to 30 ratio suggests that some restrictions even amongst staff in the provision of this type of service will be necessary in most circumstances—but this is a matter I would prefer to deal with when I discuss what services should be provided, and, before I do that, I want to say a few brief words about from where the service should come.

The main issue here—and I am speaking of a service provided by the library—is that of a siting in the library versus a siting in the department. Most of the arguments in favour of the latter course hinge on the desirability of close and continuous contact with clients, which the Bath experiment showed to be an essential element of a successful information service. An extensive amount of interaction does, in theory, permit an individually-tailored package to be presented to each client. We found during the Bath service, for example, that the closer the contact, the better the perception of interests and of changes in interest which can occur with bewildering rapidity in the media-dominated social sciences. Close contact allowed a true appreciation of a client's approach to his topic—whether it was behavioural, philosophical, methodological or whatever—and of his willingness to accept material in a foreign language, or material which required other skills, such as mathematical ones for example, for the appreciation of its content. It permitted more accurate assessment of relevance and recall needs—the busy teacher with heavy administrative duties valued high relevance, and the research-oriented member of staff, high recall—and facilitated the adjustment of the supply of information to different 'input thresholds'. It allowed the information officer to meet the problems of the non-library user and of those members of the department who might otherwise have been deprived of information by virtue of their personality—sometimes acute shyness, but often an unfounded self-confidence, one aspect of which being the conviction that the necessary information would somehow be attracted to them without any effort on their part, presumably as a result of the magnetism of their academic gifts.

But there are, of course, drawbacks to the library's placing its information officers in the departments, not the least of which being the problems of overall co-ordination and control and of what to do when the information officer has to serve more than one department. In such a case it would usually be advisable for the information officer to be based in the library and attempt to keep a foothold in all camps. But then again, problems present themselves. There are the difficulties of co-existence with the lesser mortals in the library whose lot it is in life not to carry out those prestigious tasks dignified by the title of 'information work'—there being an acute danger that the long-standing rivalry between librarians and information officers in industry is being carried over to the universities. The information officer may find it difficult to bridge the confidence gap if he is based in, and therefore perhaps identified with, the library, the resistance of users to seeking advice from librarians, from whatever mot justified or not, being almost legendary. Moreover, the library-based infor tion officer, if not given the freedom to wander around the campus, will the task of preserving communications an impossible one, given the acaden innate and unshakeable tendency to maintain a dignified brick wall of r reply to telephone calls and memoranda.

Finally, I should like to say a few words about what exactly the service sh comprise. At the conclusion of the Bath experiment an attempt was mad judge the priorities assigned by clients to different aspects of the service. T valued the current awareness activities more highly than the retrospec searching service, a fact which often surprises information officers who h had few requests from users in this field—but we no doubt have here a cas supply unleashing latent demand. It is interesting to note that receiving inst tion themselves in literature searching was rated very low, except by the your members of staff, who tended to be less willing to delegate searching.

In the case of current awareness services, an externally produced tool of s kind may well give the best results for some clients. We found at Bath, example, that the Department of Trade and Industry's 'Contents of re economics journals' met all the needs for current awareness in the perioc field of a number of clients working in the mainstream of economics. Obvio the information officer is under some obligation to identify those clients wh needs might be fully met by cheaper methods than the personalized scann service which was the norm during the Bath experiment, and which averaged we estimated, at £70 per client per annum—about the same, incidentally, profile with a mechanized retrieval service. At the same time, the informa officer must guard against depersonalizing the service, remembering that evidence points to the fact that in all subjects users consistently prefer informal to the formal, the personal to the impersonal, method of acqui information.

When scanning by the information officer is necessary, the result can bulletins, such as the *Current Awareness Bulletin in the Human Sciences and Man ment*, which I edited at Surrey University—or personalized SDI as during the I service, and as at the City University now. Where a significant number of cli have identical interests, a bulletin covering their area seems to be the ansv Otherwise, bulletins tend to be too long to scan, or so selective that re suffers, and a really effective bulletin, comprehensive in coverage and organ so that all its recipients can find their interests quickly, could easily cos much as, or more than, a personalized current awareness service.

During the operation of the Bath service, the physical separation of management and education libraries accounted for much of the detail of system of bulletin circulation, which supplemented the main personal current awareness service. This underlines the point I have made befo the need for flexibility. Within the university world, a host of factors influence the pattern of information needs—the size and physical layou the university, the nature and extent of the library stock, the types of subj taught and the approach to them (for example, vocational or otherwise), extent of the orientation to research, the availability of other library resou and so on. (This does not mean, however, that co-ordination of the work of information officers in different universities is impossible. On the contrary, it is imperative, and is already proceeding, albeit in a somewhat piecemeal fashion.) These and an array of other factors then, will influence the pattern of information need and the pattern of information transfer once someone, whether library-supported or not, whether library-based or not, has been appointed to, or, in some cases, has simply decided to, go some way towards meeting that need.

REFERENCES

1 EVANS, SUSAN M. and LINE, M. B. A personalized service to academic researches: the Experimental Information Service in the Social Sciences at the University of Bath. *J. of Librarianship*, 5 (3), July 1973, 214–32.

2 BATH UNIVERSITY LIBRARY. Investigation into Information Requirements of the Social Sciences. *Research report no. 1: Information requirements of researchers in the social sciences*, 2 vols, May 1971.

Towards Informatics 2

Kevin P. Jones

Malaysian Rubber Producers' Research Association

Paper presented at a meeting of the Aslib Co-ordinate Indexing Group, 12th November 1973.

WHAT is informatics? First it must be confessed that it seemed to form an excellent conference label. In this respect it may be compared with linguistic confections, like Infochem and Infofair. Too many meetings are burdened with over-long titles peppered with prepositions—was it a conference on . . ., or a symposium in . . .? Further, informatics appears to be acceptable in a wide variety of European languages: it could be argued that its adoption for the Co-ordinate Indexing Group's annual conference was their modest contribution to European unity.

Infochem and similar concoctions are proper names; in consequence lexical definitions are not expected. This is not the case with informatics. As it has still to find its way into English dictionaries, a definition seemed to be demanded and was essential for the Informatics 1 hand-out. A definition of Russian origin[1] was traced in a review paper by Wellisch;[2] although excessively long, using it appeared to be safer than amateur lexicography. It is quoted below:

> Informatics is the processes, methods and laws relating to the recording, analytical-synthetical processing, storage, retrieval and dissemination of scholarly information but not the scholarly information as such which is the attribute of the respective science or discipline.

Wellisch used the word 'scientific' instead of 'scholarly', but it seemed safer to avoid the inevitable confusion between scientific information and information science. Besides there appeared to be no valid reason for limiting informatics to scientific information, or with the vision of hindsight to scholarly information either. Icarus in *The Information Scientist* commented that 'such language was usually reserved for patent claims'. Not only is it too lengthy, but it is also over-restrictive and largely fails to differentiate informatics from information science or even library science. The essential feature of the Russian approach to informatics, that it is based on inter-disciplinary endeavour, is ignored.

Until a British approach to problems encompassed in what may be termed informatics really blossoms and bears fruit, it is virtually impossible to define informatics accurately. Nevertheless, that blossoming is hardly likely to take place unless some attempt is made to define what Informatics (with a capital 'I') hopes to achieve. Within this specialized sense:

> Informatics aims to be an inter-disciplinary approach to problems, especially those relating to structure and meaning, encountered in the design and operation of information systems. Further, techniques developed to improve information systems may be exploitable in a wider context.

'Information system' is probably too broad in meaning, but 'information retrieval system' would be too restricted as it may be desirable to examine such areas as authorship which retrieval systems would exclude. The word 'structure' is reminiscent of heavy engineering; classification would be preferable, but for the restricted connotations which too often surround it. The phrase 'an inter-disciplinary approach' may lead to the false impression that Informatics is a stage in the formation of an inter-disciplinary discipline. This is not so: Informatics is merely envisaged as a cockpit for the exchange of information, to stimulate thinking on the edge of the over-placid waters of information/library science. (See *Note added in proof* p. 497).

At this early stage it is necessary to squash some hierarchal notions about informatics: for instance, is it a social science or a part of computer science? People are involved in many stages of an information system, yet neither physics nor chemistry could survive without people. It may be argued that gravity and sulphur would survive without people, but that information is a peculiarly human notion: in which case it can be countered that the notion of information, whether human or not, must be present before ideas (no matter how fundamental) can be conveyed. The more a subject spreads, the less coherent and meaningful it tends to become. Social science is already large—it is doubtful if it would gain much from the addition of informatics. Computers may, probably have, become an essential tool in information science, just as pens or typewriters are essential tools of authorship, but few authors are typewriter mechanics. On the other hand knowledge gained through studies in machine perception and computational linguistics, for instance, may hold the germ for developments applicable to information retrieval systems. Hence the informaticist should be aware of, rather than a part of, computer science.

Some, perhaps it is many, are content to do things the way that they have always been done, and never question why it is that they are doing them. For them it is safer not to travel and then there can be no danger of arriving They will argue that it is inconceivable that anyone else could have any notion about, let alone surmount, their peculiar problems. There can only be one answer to this and that is to peep over the wall and bring back reports of what appears to be going on on the other side. Travellers' tales are rarely satisfactory, but a few indications of how others apparently perceive and tackle problems similar to those encountered within information science are introduced in the hope that others may be persuaded to look for themselves.

One Informatics 1 paper was about the application of semiotics to landscape planning.[3] At first sight it may appear to be of slight relevance to 'our problems' and the author, James Hope, was slightly apprehensive about presenting it. Yet Hope's paper was discussed, after dinner, well into the night. Broadly, semiotics is the interpretation of meaning from signs; in the case of Hope's work the signs were either the natural or man-made environment. The landscape planning was the assessment of landscape in terms of recreational potential as seen from different human standpoints—one may find a mountain stream a place of tranquility, another may think of the trout and yet another may feel isolated and insecure. In other words Hope set out to establish classificatory criteria for the landscape and studied, by questionnaire, the way that others classified the environment for themselves. The paper was directly relevant for its approach to the problems of meaning and classification and it is not without interest that the author had made use of Vickery's studies in the pursuit of the latter. But it was also of indirect interest in that two normally unassociated techniques (semiotics and planning) had been brought together successfully.

'If we did not classify objects and experiences in commonly accepted terms, we could not transmit information because no one would understand what we were talking about.' 'Classifications tend to be subjective, as they reflect some of the opinions of the authors: they are also transitory, because they cannot always be modified to accommodate new ideas.' Both of the above quotations could have been extracted from a textbook on bibliographical classification, but the former[4] was traced in a textbook on spatial organization in geography, whilst the latter[5] was discovered, by chance, in a book on actinomycetes. The former also demonstrates how Sokal and Sneath's numerical taxonometric techniques[6] may be applied to geographical research.

There are dangers in applying techniques developed for one discipline to another, but these dangers can be minimized if personal contacts are established: that is one of the primary functions of the Informatics conferences: to act, if possible, as technological gatekeepers for information science. Moreover, it would be absurd for a profession, many of whose members imagine that they are keeping the wheels of industry turning by switching on their 'information taps', to ignore what others may be doing in related fields.

A catalogue of disciplines, or sub-disciplines rarely forms a satisfactory definition of a new area for study. Too often such catalogues are like unquantified recipes—do we take a pinch of information theory and place it in a basin of linguistics with six taxonomists and should the last-named be new-laid—that is numerical taxonomists? On the other hand there must be some areas which would be, more or less, immediately rewarding in which to establish contacts. At this stage it might be tempting to state that such and such may have nothing to offer, yet tomorrow someone from that area may produce some significant theory. Further, individuals frequently develop interests almost at variance with their 'normal' activities—Professor Ziman's interest in scientific communication[7] has led him partially away from the 'normal' preserves of physics.

Having warned of the dangers inherent in recipes and catalogues, it is necessary to throw one together for informatics. Information theory is probably a good, but dangerous, starting point—at least it appears to share the same central theme of information. But information theory was developed to assist in the transmission of signals (*without* meaning) and we are primarily interested in signs and symbols (*with* meanings). Nevertheless, we frequently become involved in coding without relation to meaning, whether in the design of minimum length notations for bibliographical classifications, the application of polygraphs for post-co-ordinate indexes or in questions involving computer storage. Many of these coding problems can be simplified through recourse to information theory. Further, the nearest which information science has progressed towards a fundamental law, akin to the law of gravity, is in Bradford's Law of Scatter which shares common ground with information theory. Finally Brillouin's dictate[8] that the output of an information system can never exceed its input, must never be forgotten—theoretical perpetual motion information machines abound in information science.

'Colourless green ideas sleep furiously' is probably the best-known quotation from linguistics. It is perfect syntactically—so perfect in fact that we may be tempted to search it again and again for a meaning which it almost certainly lacks. Linguistics claims to be a science and like information science is a recent phenomenon even though its origins can be traced back for nearly a century. Computational methods have, as in information science, had a considerable influence on its development, but whereas information science now appears to be producing modest fruits from computerization, mechanical translation has been unsuccessful except in acting as a catalyst within linguistics.

Much linguistics effort has been devoted to syntax, phonetics and comparative studies. The first does bear on information retrieval problems—especially in operations involving the analysis of whole-text, and also in the compilation of post-co-ordinate strings, the analysis of compound words for fracturing (or otherwise), and in the design of links and roles: moreover, semantic problems cannot be studied fully without a knowledge of syntax. Phonetics and comparative linguistics would appear to be outside present information retrieval activity. This may not always be so: comparative linguistics could act as a starting-point for examining the differences in retrieval performance between various natural language bases—are Japanese thesauri better than French or German ones?

Semantics, or the study of meaning, would seem to be the most immediately pertinent component of linguistics. Unfortunately, semantic research has tended to be relegated in the quest for syntactic fundamentals as displayed in Chomskyan transformational grammars. The appeal of syntax, at the expense of semantics, is not difficult to understand as it is relatively simple to adopt objective 'scientific' methods in the former. There seems to be some evidence, however, that sematic problems are currently receiving more attention from linguists and a fascinating spectacle is emerging of linguists developing classificatory maps to explore notions in meaning. Techniques like componential analysis (linguistics) closely follow those adopted in semantic factoring (information retrieval) and facet analysis. There are other reasons for suspecting that the problems of meaning and classification are strongly interrelated: these have developed elsewhere[9] and need not be repeated here. The importance of one discipline searching for solutions to classificatory problems in semantics whilst another searches for solutions to semantic problems in classification cannot be over-stressed. Joint effort might be more fruitful for both.

The activities of the Classification Society show that the bounds of classification are not limited by library shelves, or even reluctantly admitted as a part of thesaurus construction. Bibliographical classification, like taxonomy, is only a specialized aspect of a *fundamental* process. The aims of the taxonomist, partly due to his interest in things as distinct from items *about* things, exceed those of the librarian, however; they are more precise both in relation to hierarchal order and in terms of placement in space and time. The taxonomist is normally interested in retrospective order, but similar techniques of analytical thinking can be applied to predictive methods, as in morphological analysis and the

Delphi methods of forecasting. Taxonomic and forecasting techniques have made extensive use of computers, but the adoption of the former (numerical taxonomy which closely parallels clustering techniques) has been accompanied by lively controversy.

Other inherently classificatory areas include syntax—the structure which strings words together to form meaningful utterances (the strength of syntax was reflected in the *colourless green ideas* quotation); mapping, the periodic table in chemistry (which clearly demonstrates the predictive power of classification); elements in the construction of dance routines, and many more. Even the arrangement of goods in shops tends to be classificatory, but unfortunately there is much cross-classification as in libraries: frozen peas, fresh peas, canned peas and dried peas, but never ever peas. Clearly lines have to be drawn at some point, but no reasoned approach should be ignored.

If this fundamental nature of classification and meaning is to be explored in depth, then it is essential to be aware of the way in which the world is perceived and thought about, and how we are informed of these observations. Studies in perception could ultimately lead to physiology and psychology and even to McLuhanism, anthropology and the history of art. Studies in thinking could lead us to Aristotle or Popper and on to the fringes of theology and cosmology. To return to our home territory, the principles of observation, research, authorship, approaches to media assimilation, and methods of education cannot be entirely ignored. The unsatisfactory nature of catalogues was noted earlier: now their faults are glaringly evident. First there are the omissions: logic, cybernetics (B. C. E. Scott[10] introduced an excellent paper on this approach at Informatics 1); lexis and certainly many more. Then there is the lack of quantification and probably a sense of bias which reflects the Co-ordinate Indexing Group's constant semantic and classificatory battles. Words like *philosophy* and *physiology* were thrown in like spice into a cake; even at this elemental stage of informatics it is obvious that such vast areas of knowledge must be approached with a caution approaching reverence.

Progress in information science has been hindered by the necessity of finding instant solutions to problems: the rarely applied information technology might be a more apt description for much so-called information science activity. This pressure for immediate solutions turns attention towards gadgetry and techniques lifted from elsewhere and away from fully developed theories. An excellent current example of over-rapid implementation is the draft ISO recommendation[11] for the construction of monolingual thesauri. An ISO document should be magisterial; it should form a consensus of world thought. Yet, it fails to produce adequate definitions, it is frequently open to misinterpretation and it lays down methods where it should merely have suggested alternative approaches. Moreover, some of the examples are incomprehensible; one example shows how *trade winds* could be fractured into *climate+geography*: in *one* particular system this linguistic nightmare might work, but its very mention in a world code of practice is utterly reprehensible. Informatics seeks to redress the balance by substituting long-term aims for slick thinking. Thus the purpose of informatics may be interpreted, in part, as being therapeutic in the way that Wittgenstein considered philosophy to be therapeutic. The only consolation for those who demand immediate returns may be found in spin-off—was it non-stick frying pans which came from the Moon adventure?

If we can escape from the notion of being plumbers attending to our cisterns and information taps, perhaps it may be possible to exploit some of our more thoroughly developed techniques elsewhere. Two classificatory techniques described at Informatics 1 (Farradane's and Leo Jolley's) may be capable of much wider application than information retrieval. Jolley's method,[12] based on set theory, should be applicable as a forecasting technique as gaps in a technology become discernible through using it. Farradane's work[13] might well be stimulating to biological taxonomy. Lynch's work on file compression[14] also has much wider implications.

Up to this point Informatics has been interpreted mainly within the specialized context of the Aslib CIG conferences which has naturally reflected the Group's central interests and problems. A wider view of informatics is taken in a very extensive review by Foskett.[15] He explores the origins of informatics within the Soviet Union and reinterprets the Russian approach in terms of more accessible Western literature. Although Foskett adds much to the subject, his review is open to criticism on two counts: the syntactic element of linguistics is accentuated whilst semantics is largely ignored and the sociological aspects are emphasized—Foskett is attempting to demonstrate that informatics is a part of social science. Indeed, a disproportionate amount of space is devoted to the two cultures, both in terms of arts and science, and librarianship and information science. This probably reflects the author's distress at what he, as a librarian, regards as a divided profession. In my opinion, informatics lies beyond these trivial (within this context) distinctions. Some social scientists would lay claim to practically all the external (from 'our' point of view) disciplines mentioned so far, including linguistics and philosophy, but this would be of little concern to linguists or philosophers. Informatics should be able to use social science techniques if required without becoming a component of a vast, shadowy morass. Information is too fundamental a phenomenon to be submerged in petty professional squabbles or in an already over-large discipline: it should be capable of being examined on its own ground in the same way that components in its development, like linguistics and thinking, have been already. Brookes's definition[16] of information science as the study of information phenomena has much to commend it, especially its simplicity. It could be transferred to informatics, but for the danger of misinterpreting the meanings of information: the messages conveyed in information theory need not contain meaning. In our field a meaningless message, no matter how successfully conveyed, is useless.

Informatics 1 attempted to cover a very great deal of ground in a very short time—Dr Margaret Masterman likened the proceedings to a tread-mill. An assault course is probably a better simile: informatics had to be forced open. The conference was very fortunate in the quality and stamina of its participants. In addition to providing a highly stimulating paper[17] on interlinguas, Dr Masterman (Director, Cambridge Language Research Unit) posed many thought-provoking questions including, in an after dinner session, one on the ideal arrangement for *finding* items in a library—Farradane suggested some interesting solutions whilst the librarians present appeared to sink rapidly. Discussions ended after midnight and began again at breakfast, and some only ended on the platforms at King's Cross station.

Several Informatics 1 papers have been mentioned: with the exception of one, all papers presented are to be published by Aslib in the form of a separate conference proceedings. It has been quite impossible to mention them all and exclusion from this description is not meant to imply any special judgment on my part—the ones selected were only chosen to emphasize certain points. Indeed, the best-received paper has not been mentioned at all.

Informatics 2 is being held at the University of Oxford from the 25th–27th March 1974. Speakers are being dragooned into presenting papers and it is hoped that the majority of these will be from outside the normal confines of information technology. Most of these speakers will be new, but it is also hoped that a few of those who survived the Durham tread-mill (assault course?) are still fresh enough to enter another round. The majority of the speakers will be invited, but if any one wishes to make a contribution he should contact one of the Group's honourary officers.

Note added in proof: Leo Jolley suggested the following definition at the meeting: Informatics is the study of the structure of knowledge and of its embodiment in information-handling systems.

REFERENCES

1 MIKHAILOV, A. I., CHERNYI, A. I. and GILYAREVSKII, R.S. Informatics—new name for the theory of scientific information. *Naukno-tekhnicheskaya Informatsiya*, 12, 1966.
2 WELLISCH, H. From information science to informatics. *Journal of Librarianship*, 4, 5, September 1972, 157–87.
3 HOPE, J. *The semiotics of landscape.* Edinburgh: University. Department of Urban Design and Regional Planning. Planning Research Unit, 1971. (*It has not been possible to publish Hope's* Informatics 1 *paper.*)
4 ABLER, R., ADAMS, J. S. and GOULD, P. *Spatial organization: the geographer's view of the world.* Englewood Cliffs. Prentice-Hall, 1971.
5 CROSS, T. and GOODFELLOW, M. Taxonomy and classification of the actinomycetes. *In:* G. SYKES and F. A. SKINNER *eds*, *Actinomycetes: characteristics and practical importance.* London, Academic Press, 1973.
6 SOKAL, R. R. and SNEATH, P. H. A. *Principles of numerical taxonomy.* San Francisco: W. H. Freeman, 1963.
7 ZIMAN, J. M. Information, communication, knowledge. *Nature*, 224, 5217, 318–24.
8 BRILLOUIN, L. *Science and information theory.* 2nd ed. New York: Academic Press, 1962.
9 JONES, K. P. Elements of informatics: the relationship between classification and meaning. *Informatics 1.*
10 SCOTT, B. C. E. The representation of knowing and doing. *Informatics 1.*
11 BRITISH STANDARDS INSTITUTION. *Draft British Standard guidelines for the establishment and development of monolingual thesauri for information retrieval.* London: 1972 (72/80328 DC). (*M. Haines criticized this Draft in an* Informatics 1 *paper.*)
12 JOLLEY, J. L. A mathematical basis for a classification of the sciences. *Informatics 1.*
13 FARRADANE, J. The necessity for semantic analysis for information retrieval. *Informatics 1.* DATTA, S. Concept organization for information retrieval. *Informatics 1.*
14 BARTON, I., LYNCH, M. F. and SNELL, M. J. Variable-length character string analyses of three data-bases, and their application for file compression. *Informatics 1.*
15 FOSKETT, D. J. Informatics. *Journal of Documentation*, 26, 4, December 1970, 340–69.
16 BROOKES, B. C. Correspondence: from information science to informatics. *Journal of Librarianship*, 4, 4, December 1972, 272–4.
17 MASTERMAN, M. Chasing the enthymeme. Part 1. Interlinguas. *Informatics 1.*

Technical Note

Short loan collection

W. B. Woodward and M. Hird

Durham University Library, Science Section

1. Background

1.1. AMONG the more serious problems recognized in the last five years by our library staff were those arising from a time-hallowed practice of lecturing staff. This practice is to suggest that undergraduates should read either the complete text or some part of those texts which the lecturer considers may enhance his lectures. It follows that relatively large numbers of students can try to read a relatively small number of actual copies of publications during a relatively short space of time. When this happened we recognized that:

(a) Existing practices of both the library and our readers did not allow sufficient circulation.
(b) This was aggravated by 'insurance theft' of some critical texts.
(c) A proportion of the recommended texts were not in stock and even if funds were available, then the normal processes of acquisition were too slow to be effective.
(d) Repeated demands for the same title on interlibrary loan did not provide a satisfactory solution.
(e) Material in the form of offprints was unmanageable and duplicated or manuscript material was unthinkable.

2. Solution

2.1. The decision to create a Short Loan Collection (SLC) was taken when we realized how effective was a limited stock of some twenty titles 'Held at the Issue Desk' in reducing these problems. We recognized that for such material we had to have:

(a) A short and controlled loan period.
(b) Access at all reasonable times.
(c) Duplication of critical titles.
(d) Records that are clear, simple and easily created.
(e) The co-operation of both teaching colleagues and readers.
(f) A collection that can readily change to suit changing needs.

2.2 While the SLC has changed in a number of ways, and will no doubt change again, we can describe the relatively stable stage that has now been reached. The following sections may be readily related both to the outline description of the problem and to the solution. Please note that this account relates to the Science Section of the University Library. The practice in the Main Library differs in some respects.

3. Loans

3.3. Borrowers know that material is for use in the library only and that it is available during the hours that the library is open. Material may be borrowed for a maximum of thirteen hours 'in library' use in the day time or it may be borrowed on overnight loan from 9.15 p.m. until 9.15 a.m. on the next working day. Sunday is decreed not to be a working day in this respect. But in the daytime the natural timetable of the borrower usually means he removes items only for a fraction of the day. Those which are held for longer periods may well be circulating in an informal way around a group of students in a reading room, so that our loan statistics represent the minimum number of consultations. During term-time, and often into the vacation, the library is open for thirteen hours six days of the week and for ten hours on the seventh day. Access is increased by the use of a strictly controlled 'overnight loan' provision in the scheme. In the vacation access is by and large limited from 9 a.m. to 5 p.m. on weekdays with Saturday mornings, though this is extended in the following ways. Apart from overnight loan the student may qualify for a library key privilege or he may be able to borrow material to take home. During vacations the present loan policy is as follows. In both the Christmas and Easter Vacations the SLC is retained in the Science Library because sufficient undergraduates stay in Durham to read. For the long vacation undergraduates may borrow up to three titles on a 'first come first served' basis, this includes a reservation facility to avoid a stampede.

3.2. Readers date and sign for each loan using a card which is unique to, and is normally held in each item. These cards are not only receipts for loans, but are also the source of statistics which are compiled and used in the way described in section 9. The nature of short loan stock is dealt with below but we must now say that the stock is divided for shelving purposes into two main types There are *books* and there are *offprints*. The books are shelved alphabetically by title. The offprints are kept in boxes related to courses. The boxes are shelved alphabetically according to the name of the lecturer giving the course. It is possible to minimize the time needed to find books because the loans are recorded on the cards which are retained in the shelf in a BLL type plastic holder in the place of the book. Material may be reserved by a reader for any reasonable time of collection. This does not inhibit borrowing by other readers in the period leading up to that time since the second applicant is told that there is a prior claim in existence and the great majority of our readers respect such a claim and return the book. There is a daily check that all material has been returned and this is made as close to 9 a.m. as possible. This check shows up any loans that are overdue and the borrower is chased. As yet it has not been necessary to fine readers.

4. Stock

Recommendations

4.1. Most suggestions for material for the SLC are made directly by academic staff to the SLC Librarian. The librarian often has a difficult task in ensuring that these suggestions are made in good time. Our experience has shown that personal contact is a more effective way than the formal invocation of a timetable. The suggestions from lecturers include titles from reading lists and additional references that are given in the course of lectures and seminars. We have found that students will tell us of both existing and possible queues. Library staff will also spot some of these. The librarian having recognized a queue will tell the lecturer concerned in order to discover if this is likely to be either a once-and-for-all event or a recurrent problem.

5. Source

5.1. There are a variety of sources for the material held in the SLC. Material can be removed for either a short or a long time from the 'open' library shelves. In either case a pencil annotation is made both to the Name Catalogue and to the Shelf List. If a title is considered likely to be sought at the shelves by readers then a shelf record is also created in the form of a dummy book announcing the relocation of that item in the SLC. These shelf records are used where a bound volume of a journal has been removed or in areas where the SLC is still a novelty. Books may be removed from the open shelves either semi-permanently or annually and automatically for the required period. Some SLC items are duplicates of open shelf material. Rarely do we find we need to duplicate items already in SLC. Some material acquired for the SLC is new to the library and in the case of books these are catalogued and classified with all speed. Other material belongs to lecturers, to students and to other libraries. Offprints are not classified and catalogued other than in the computer-produced lists; for this see section 9, 'Records'.

6. Nature

6.1. The things that we have called books include in the SLC not only books in the strict sense, but also bound copies of journals. The things that we have called offprints are varied in nature and they are described below:

(a) Articles held in stock.
(b) Articles obtained on interlibrary loan.
(c) Reprints and offprints.
(d) Cyclostyled lists and pamphlets.
(e) 'Teaching kits.'
(f) Manuscript copy which may condense information, synthesize ideas or criticize published copy.
(g) Diagrams and maps, some of which may be used and retained by readers.

7. Funds

7.1. There is a Short Loan Book Fund of £200 per annum. There is also a fund of similar size for open-shelf duplicates. These funds are regarded as very largely removing from departmental book funds the need to provide for the effect of student members on library stock. There are some 1,500 students in twelve science and social science departments for which the Science Library provides a major service. The use made of the SLC varies from department to department; numerically the most important users are anthropologists, life scientists and geographers. At the other end of the scale are the physical scientists and mathematicians.

8. Staff

8.1. A Library Assistant is engaged for most of her time in managing the collection which holds about 1,000 items and achieved in 1972 some 16,000 loans. The number of loans has increased year by year at a substantial rate of up to 100 per cent per annum, though the figures for 1973 show an increase of only 12 per cent. The SLC is always manned; by and large in term time the work is that of service to readers and in vacation it is of servicing the collection. This includes additions to and deletions from the collection; these processes are aided by the production of records in computerized form.

TABLE 1: *Examples of number of loans of individual items in 1972–73*

No. of loans between	*Recorded loans per item*
Example 1. A co-operative lecturer who manages his stock	
0–9	4, 7, 9
10–19	*12*, 13, *15*, *17*, *18*
20–29	20, 20, *22*, *22*, *23*, *23*, 23, *27*, *27*, *28*
30–39	30, *31*, *31*, *32*, 33, *34*, 38
40–49	40, *43*, 43, *44*, *48*
50–59	*51*, *52*, *54*, *56*
60–69	—
70–79	*74*, *76*
80–89	*81*
90–99	91
100–109	—
110–119	112
120–129	125

books 25 (*nos.* italicized) 941 loans
offprints 15 608 loans
40 1549

Example 2. An 'average' lecturer's stock record	
0–9	0, 0, 0, 1, 1, 1, 1, 1, 2, 2, 3, 3, 4, 4, 4, 6, 7, 8, 8, 8, 8, 8, 8, 9, 9, 9,
10–19	10, 10, 11, 11, 12, 12, 13, 13, 13, 15, 15, 16, 16, 19
20–29	20, 21, 27, 28
30–39	—
40–49	45

offprints 45 loans 442

No. of loans	*No. of items so borrowed*
Example 3. Good intentions but a failure to achieve effective use	
0	45
1	7
2	3
3	1
4	1*

57 items
20 loans

(* 1 is a book)

9. Records

9.1. *Lists* of stock are maintained in the form of computer print-out on continuous stationery, and the details of these records are described in B. Cheesman and R. N. Oddy, *Durham University Library Short Loan Collection; computerized record handling* (Program, vol. 6, no. 3 (1972), pp. 204–16). Using the computer it is possible to produce name, title, subject/course lists. The provision of lists of titles under the name of each lecturer involved means that we can feed back data on the use of each recommended title. He can then tell us what changes we should make as well as remind himself that he may not be making the source of references known to his students or he may be giving reading lists that are unmanageable. The temporary changes that are made to permanent library records have already been indicated.

10. Stock weeding

10.1. It is just as important to weed redundant stock from the collection as it is to feed in new items, providing that a state of reasonable stability is achieved. This weeding is valuable because shelf space is limited and finding and filing times are reduced where lists and shelving sequences are short. It is possible and desirable for readers to browse and find alternative choices among the offprints, but more often, and almost invariably for books, the reader wants a known item without delay.

11. Conclusions

11.1. The SLC has reduced queues for material to the point where users, for the most part, have a high degree of certainty that a given title will be available when wanted. 'Insurance theft' in areas that were formerly denuded has now largely ended. Not only are readers able to borrow more titles from the SLC than they could from the open shelves when those titles were under similar pressures, but other benefits have emerged. These benefits include a rapid response to needs arising from a 'new' subject area. This may well be associated with a new lecturer who has not yet found his way through the book fund jungle. The SLC has also been welcomed by lecturers who have run an informal loan service from their own publications. Sometimes they reached the stage when the service became too demanding. A most useful feature of this Short Loan Collection which distinguishes it from most others is the way that individual lecturers are given data on the use of each reference. This data can indicate both to the lecturer and to the library the need for action of some sort. This may be making clear to students that named titles are available in the collection or it may indicate that pruning is necessary. The data listed in 9.1 indicates the great variety of degrees of use. The reasons for variation can be imagined and any discussion is possibly best left to personal and private meetings between interested parties.

11.2. The SLC is also the *sole* place in the library for some rapidly developing areas such as biochemistry, where there is material suitable for undergraduate use. The main reason for our lack of undergraduate texts here is that they have not been written and only periodical literature is available, and this in volumes needed also by teaching staff and research workers.

1.7.3. The Short Loan Collection has evolved and is working well. A possible next stage may be to produce Short Loan material on microfiche in order that copies can, be made available in Departments and Colleges and possibly also to individuals. This should reduce queues still further and give the reader more choice as to when and where he reads. There are problems to overcome, including that of copyright. We do not think that the SLC in Durham University Library, Science Section, has yet reached its final form.

BRIEF REVIEW

Work study & O and M Abstracts. Vol. 1, No. 1 October 1973.
Published eight times a year by Anbar Management Services in association with The Institute of Work Study Practitioners.

This is the latest to join the Cemach stables, sporting the light blue colour of the Institute of Work Study Practitioners also to be seen on this Institute's official journal *Work Study and Management Services.* There is, of course, no difference in style, format or presentation of this new service which takes its place with *Accounting and Data Processing Abstracts, Marketing and Distribution Abstracts, Personnel and Training Abstracts* and *Top Management Abstracts,* all published in association with the most relevant organisations. For anybody who is not acquainted with this valuable service it may be stated that over 200 Journals are scanned for quality articles and that these are abstracted and allocated to one or more of the titles mentioned above. Additional services include *Management Services Bibliography,* use of a tear sheet library and provision of photocopies. This fifth abstract title fills a gap that has been apparent for some time.

The Library Department of **Better Books (London) Ltd.** offers librarians one of the most efficient services in the country.

As a long established supplier to many U.K. and overseas school, university, public and private libraries, we are familiar with the requirements of librarians and are able to meet most demands.

English, American and foreign language texts are quickly available through us, particularly since we can draw on the wide range of stock titles covering the Performing and Visual Arts, the Social Sciences, Politics, and Literature, carried by our main bookshop.

We shall be happy to see you at our shop premises (148 Charing Cross Rd.) at any time during normal opening hours: Mon–Sat 10.30–8. Or if preferred, librarians are welcome after normal hours, to view stock by arrangement.

'Micropublishers, reader and retrieval system manufacturers, microform users – in fact, almost everyone connected with the micrographic industry – will find a valuable and convenient reference source in this book.'

Micrographic Weekly

Miniaturised Communications

A review of microform

B. J. S. WILLIAMS

Published by

THE LIBRARY ASSOCIATION

in conjunction with

THE NATIONAL REPROGRAPHIC CENTRE
FOR DOCUMENTATION

£1.50 (*£1.20 to L.A. members*)

THE INSTITUTE OF PHYSICS PUBLISHES BOOKS AND PERIODICALS COVERING ALL AREAS OF PHYSICS

National Physical Laboratory Conference, April 1972

Machine Perception of Patterns and Pictures

Contents of the proceedings include
Optical character recognition
Applications of machine perception in medicine and biology
Speech recognition
Applications of machine perception in nuclear physics
General aspects of pattern recognition
Digital image processing for information extraction

1972 363pp 10" x 7" 0 85498 103 9
£10.00

Padé Approximants
edited by P R Graves-Morris

Nine lectures covering both the theory and various applications of Padé methods which were delivered at a summer school held at the University of Kent in July 1972

1973 133pp 10" x 7" 0 85498 023 7
£7.00

For further details about these or any other Institute of Physics publications, please write to

The Institute of Physics
Netherton House, Marsh Street
Bristol BS1 4BT (England)

Library Removals start here

In Bullens planning office.
Every move is planned in detail;
problems of access or timing overcome,
men, vehicles and equipment allocated –
well before the move begins.
So you move safely, quickly and with least
disruption.
That's the difference between Bullens
and any other contractor.
Phone today.

Bullens
TRANSPORT SERVICES

Bullens Transport Services Ltd
408, Hornsey Road,
London, N.19 4EB
Tel 01-272 6671

*Also at Bristol, Hinckley
and Newton-le-Willows.*

A Gillspur COMPANY

FIRST for carpets
Dodson Bull

UP TO 30% DISCOUNT
BRANDED CARPETS

● All makes available with full Manufacturers' Guarantees ● NO IMPERFECT GOODS SOLD ● Free delivery in U.K. ● Expert fitting service available

£200,000 carpets on display

In our extensive London and provincial showrooms

Free brochure on request to Dept. ALB

DODSON BULL CARPET CO. LTD.

LONDON: 5 & 6 Old Bailey EC4M 7JD. Tel: 01-248 7971
BIRMINGHAM: 164 Edmund St B3 2HB.
Tel: (021) 236 5882
BOURNEMOUTH: 268 Old Christchurch Rd BH1 1PH.
Tel: 21248
BRIGHTON: 2-5 North Road BN1 1YA. Tel: 68402
BRISTOL: 2-3 Royal London House, Queen Charlotte St
BS1 4EX. Tel: 28857
LEEDS: 12 Great George St LS1 3DW. Tel: 41451
MANCHESTER: 55-61 Lever St M1 1DE.
Tel: (061) 236 3687/8/9
NEWCASTLE-upon-TYNE: 90-92 Pilgrim St NE1 6SG.
Tel: 20321/21428
WESTCLIFF-on-SEA: 495 London Rd SS0 9LG.
Tel: Southend 46569
9.00-5.30 Mon.-Fri. Sat 9.00-12.00 (Manchester 9.00-4.00)

British Technology Index

CURRENT SUBJECT GUIDE TO BRITISH TECHNICAL JOURNALS

FOR TRACING AND RECALL

of $\left\{\begin{matrix}\text{specific}\\ \text{recent}\end{matrix}\right\}$ information

In the Field of Applied Science, Engineering and Manufacturing Technology

Monthly Parts and Annual Volume

THE LIBRARY ASSOCIATION

7 Ridgmount St. Store St. London, WC1 7AE

(Phone: 01-636 7543)

ISI's Search Service:

Next best thing to owning your own Science Citation Index®.

Many libraries that don't own the *Science Citation Index* often "rent" the use of it through our Search Service.
Just tell us what subject you want searched, which years of the journal literature (1961-73) you want to cover, and how fast you need the search completed.
We'll put one of our Information Specialists to work with an SCI® and send you the results on convenient index cards. If you're in a big hurry, we'll even telephone the search results.
The minimum charge is $50, for which you get up to two hours of searching. Thereafter, it's $25 per hour. You tell us when to stop.
Use the coupon for more information on Search Service.

01873 83

Please send additional information on ISI's Search Service.

Name
Title
Organization
Address
City
State
Zip
Country
Telephone

13-369

Institute for Scientific Information
325 Chestnut Street, Philadelphia,
Pennsylvania, U.S.A. 19106,
Tel.: (215) 923-3300,
Cable: SCINFO,
TELEX: 84-5305

ISI

Published in England by Aslib, 3 Belgrave Square, London SW1X 8PL
Printed by Alden & Mowbray Ltd at the Alden Press, Oxford